

THE AMERICANS IN PANAMA

BY

WILLIAM R. SCOTT

ILLUSTRATED

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TO
MY MOTHER

PANAMA CHRONOLOGY

- 1501. Bastides discovers Panama.
- 1502. Columbus explores coast of Panama.
- 1509. Spanish settle at Nombre de Dios.
- 1513. Balboa discovers the Pacific.
- 1519. City of Panama is founded.
- 1532. Pizarro leaves Panama to conquer Peru.
- 1584. Town of Porto Bello founded.
- 1668. Morgan's pirates capture Porto Bello.
- 1671. Morgan burns city of Panama.
- 1698. Scotch colony perishes in Panama.
- 1739. English destroy forts at Porto Bello.
- 1821. Panama revolts from Spain.
- 1850. Construction of Panama Railroad begun.
- 1855. First train crosses the Isthmus.
- 1880. French begin attempt to dig a canal.
- 1889. French canal company bankrupt.
- 1894. New French company resumes operations.
- 1903. Republic of Panama is established.
- 1904. United States begins building a canal.
- 1905. Stevens succeeds Wallace as Chief Engineer.
- 1906. Lock type of canal is authorized.
- 1907. Lieut.-Col. Goethals becomes Chief Engineer.
- 1908. Maximum annual excavation recorded.
- 1909. Concrete work is begun in the locks.
- 1910. Canal is half done as to excavation.
- 1911. Locks and Gatun Dam half done.
- 1912. New Panama Railroad is finished.
- 1913. First ship passes through the canal.
- 1914. Canal open to commerce of the world.
- 1915. San Francisco Exposition.

CONTENTS

CHAPTER	PAGE
I.—THE LAND DIVIDED—THE WORLD UNITED	1
II.—THE LIFE COST OF THE CANAL . . .	9
III.—THE SPANISH IN PANAMA	21
IV.—THE PANAMA RAILROAD	30
V.—THE FRENCH IN PANAMA	39
VI.—THE AMERICANS IN PANAMA . . .	46
VII.—THE ROOSEVELT IMPETUS	52
VIII.—TAKING THE CANAL ZONE	58
IX.—THE GEOGRAPHY OF PANAMA . . .	76
X.—GETTING UNDER WAY.	86
XI.—THE CANAL UNDER WALLACE . . .	92
XII.—THE CANAL UNDER STEVENS . . .	108
XIII.—THE CANAL UNDER GOETHALS . . .	125
XIV.—LOCKS AND DAMS.	157
XV.—THE CULEBRA CUT	172
XVI.—LABOR	185
XVII.—COMMISSARY—QUARTERS—SUBSISTENCE .	200
XVIII.—CIVIL ADMINISTRATION. . . .	211
XIX.—THE SOCIETY OF THE CHAGRES . . .	218
XX.—THE TRADE OUTLOOK	226
XXI.—SETTLING OUR ACCOUNT WITH COLOMBIA	238
XXII.—THE MONROE DOCTRINE	249

LIST OF ILLUSTRATIONS

The Chagres River	<i>Frontispiece</i>
	FACING PAGE
Col. W. C. Gorgas	II
President Roosevelt	55
Map of Isthmus of Panama	76
John F. Wallace	93
President Taft	101
John F. Stevens	115
Col. Geo. W. Goethals	131
Assistant and Division Engineers	147
Profile Map of the Canal	157
Entrance to a Lock	159
Interior of a Lock	165
The Culebra Cut	173
Deepest Part of the Cut	181
Old and New Machinery	191
Quarters for American Employees	205
Governors of the Canal Zone	215
Gatun Lake	223
Map of Trade Routes	227
Cover Design	Employee's Check Number

FOREWORD

VERACITY to the facts concerning the Panama Canal requires that a writer not merely view the object which he describes, but that he actually become a part of the mechanism that is giving it form. He may thus practically illuminate observation with experience, and so vivify the object in his own thought, that his attempt to present it to others will be a close approximation of the truth.

In the five months the author spent in Panama, he was for slightly more than three months an employee of the Isthmian Canal Commission, living the routine life of a canal employee. He discovered that, had he followed the usual method of coming into the Canal Zone on one steamer, taking notes, and leaving on the next steamer, he would have missed many fundamental facts, which absolutely must be known if a really trustworthy account of the greatest task of the age is desired.

The Panama Canal is not the monument of any one individual American, nor of any select few individual Americans. In generations to come, the canal, like the skyscrapers of our cities, will be viewed as a manifestation of the building genius of the American people, just as the Pyramids of Egypt are not re-

FOREWORD

membered so much as the work of a given Rameses as a manifestation of the big building instinct of the entire race.

This book is unjust to the generality of Americans who have helped to make the canal a success. Some day the government will authorize a history of the canal that will give the proper prominence to the rank and file as well as to the subordinate officials. But the treatment here undertaken, through the necessity for condensation, touches only the men who have affected the canal in the broadest way.

The average American layman desires an authoritative history of the project, but he particularly desires a nontechnical review, and decidedly one which distinguishes events from mere incidents, so that he may not be burdened with a mass of details which make it difficult for the essential facts to be kept in mind and at the tongue's end for immediate and intelligent conversation.

Those who prefer a more exhaustive treatment must look to the formidable annual reports of the Isthmian Canal Commission, to the files of the Canal Record, the speeches of Col. Goethals, and to a bibliography that already is extensive and is growing at a lusty rate.

Central America and the islands of the Caribbean Sea afford a rich field for historical writing of the

FOREWORD

most intensely interesting character, but one volume cannot adequately cover so much ground. The scope of this book is limited to the Isthmus of Panama, covering a period of four hundred and ten years. Only so much of the history of the Isthmus under the Spanish, and during the construction of the Panama Railroad and the French attempt to dig a canal, is given as was necessary to lend a perspective to the work of the Americans.

W. R. S.

PADUCAH, KENTUCKY.

THE AMERICANS IN PANAMA

CHAPTER I

THE LAND DIVIDED—THE WORLD UNITED

A MERICANS, your dream of an interoceanic canal is near to realization!

Where the Spanish scoffed and the French failed, the Americans have triumphed. South America, like Africa, soon will become an island, and the heroic searchings after a passage to the Spice Islands, by Columbus, will reach fruition in 1913, by the hands of a nation, not of the world which he knew, but of that very new world which he discovered!

The Panama Canal has its broadest significance in the prodigious transformations it will make in the world's geography. It is a literal fulfillment of the Scriptural promise to man that he should have dominion over all the earth.

There is poetic justice in the snatching of this vast enterprise from the parental hands of Europe by the lusty offspring of the Western Hemisphere. We thereby vindicate our slogan of America for Americans, because we have demonstrated our sufficiency in the face of the largest demand upon man's engineering acumen.

If it should have been said in 1904 that in nine years we would have removed more than 200,000,000

THE AMERICANS IN PANAMA

cubic yards of earth and rock, laid 5,000,000 cubic yards of concrete, made dams and fills of more than 50,000,000 cubic yards, relocated the Panama Railroad, spent less than \$300,000,000, and put the first ship through from the Atlantic to the Pacific, Europe would have smiled at our youthful temerity! Yet, in 1913, we will have done precisely that.

To-day there is no reason for revising the statement by Theodore Shonts that: "The physical construction of the Panama Canal is, all things considered, the greatest task of modern times. It is in the highest degree exceptional in magnitude, complexity, and cost."

The American-Panama Canal has risen phoenix-like out of the ruins of the French enterprise. For four centuries events have been shaping at Panama to make our final attempt successful. When we began, crude as the conditions were, the sting of the Isthmus, except its diseases, had been drawn. There was a beaten road from ocean to ocean, on every hand were landmarks to warn our footsteps from perilous paths, the lives that had been lost, the money that had been spent, all served to make our task achievable. We justly may be proud of our deeds, but we should not forget.

It may be asserted that the exigencies of world convenience justified the manner by which we acquired the Canal Zone; but in declining thus far to make reparation to Colombia we are violating the essential ethics of Americanism. Certainly the American people cannot afford to dedicate their crowning

LAND DIVIDED

achievement in this age with one single nation entertaining a sense of wrong because of it!

The canal entered upon its last phase with the announcement by Chief Engineer Goethals that the first ship would go through in September, 1913. Thenceforward a definite goal was seen, and, despite the slides in the mountain cut, or any other obstacles, that program will be kept. Not a sign of slackness, but rather stimulated activities have followed the bringing of the end of the task in sight. In 1912 all records for excavation and concrete work were smashed!

During the first two years and a half the canal was in its first phase. It was the period of pioneering, preparation, and adjustment. Two Chief Engineers were tried, from the ranks of civil life, accomplishing the main preliminaries to canal construction before their departure. Both were men of unquestioned integrity and of impressive ability, but neither was the one of destiny to complete the task.

The second phase of the canal was from the beginning of 1907 to the spring of 1912. During these six years the heart of the task was accomplished. President Roosevelt had found the man who was to take the organization built up by the men from the ranks of private industry and hurl it against the natural obstacles that stood in the way of success. Col. Goethals was to take the blue-prints, and a head full of theories, and work them out into the locks, dams, and cuts in concrete mold to-day.

The third and last phase, as noted, began in 1912 when the Chief Engineer set a date for the substan-

THE AMERICANS IN PANAMA

tial completion of the canal. It is distinguished by the gradual dispersion of the army of workers, by the reverse process of the first two years, and by the creation of a permanent operating force with the detail finishing work that attends every large project.

The East has furnished the canal with its Chief Engineers — Wallace from Massachusetts, Stevens from Maine, Goethals from New York. But every State in the Union has furnished the rank and file, as well as every nation in the world.

Standing out distinctly from the construction phase of the enterprise is the figure of Col. Gorgas, the Chief Sanitary Officer, now, as in the critical days of 1905, quiet, alert, confident. The last days of the canal find a perfect mechanism of his creation recording his ideas with dispatch and precision, receiving the plaudits of this and secure in the admiration of succeeding generations.

With the long ascent behind, standing upon the crest of the work of construction, looking downgrade at the early completion of the canal, one fact is emphasized in the minds of all laymen and engineers who view the project with open eyes. It is this. A sea-level canal, if not an impossibility, would have been an indefinite number of years in building and would have cost an indefinitely greater number of millions. The precipitation of more than 20,000,000 cubic yards of extraneous material into the Culebra cut, by slides, rivets that fact in the minds of all observers.

The locks may grow too small, the Gatun dam may

LAND DIVIDED

break, a caving in of the foundations of the colossal structures may occur, and other convulsions of nature may disable the canal, but nothing can rob the Americans of a wonderful achievement, nor will the work have been without glory and justification, no matter what the future holds. We still could rejoice in the sheer courage, persistence, and indomitable ability that have wrought the work in Panama.

Just as the Civil War developed Grant, and the Spanish-American War Dewey and Schley, so has the Panama Canal developed Goethals. He justly is celebrated in the periodical and daily press and in books as a splendid embodiment of Americanism—the ideal combination of ability and integrity.

It is true, of course, that the completion of the canal substantially fourteen months before the estimated date, January 1, 1915, and the saving of \$20,000,000 in the estimated cost, may mean simply that both items were overestimated in 1908 by Col. Goethals; but the tremendous increase in necessary excavation, due to slides and changes in plans, more than offsets this consideration and forces the acknowledgment that the savings in time and money represent the increased efficiency his own preëminent abilities have been able to produce.

A perspective view of the whole enterprise shows that Theodore Roosevelt, by his individual actions, on at least three occasions, vitally affected the canal and its successful consummation. When he cut the Gordian knot of diplomacy and took the Canal Zone, he made the first long stride toward interoceanic com-

THE AMERICANS IN PANAMA

munication. When he threw his weight into the scale for a lock type canal, he decided the most critical question that ever arose in the career of the enterprise. The third time his judgment prevented a great mistake was when the project definitely was taken from the possibility of private construction and placed in the hands exclusively of government supervision. There were lesser decisions of great moment, notably the order for widening the locks and the Culebra cut, and his whole connection with the project was such as to rank as the most brilliant phase of his administrations.

Before ten years have passed the American people will realize that the canal would have been cheap at twice the cost. The estimated cost, \$375,000,000, is an impressive figure, but this age is moving fast. As great as the enterprise is, it is not probable that, in the item of cost at least, it will long remain the record achievement. But it is probable that when the record is broken, it will be the Americans who break it.

To July 1, 1912, the canal had cost, fifteen months before its completion, \$260,000,000. This was divided as follows: Canal Zone, \$10,000,000; French purchase, \$40,000,000; engineering and construction, \$152,000,000; general expenditures, \$36,000,000; sanitation, \$15,000,000; civil administration, \$5,500,000; fortifications, \$1,000,000.

The canal was half done as to excavation and cost in 1910. The toll in human lives, approximately 6,000 by 1914, for a period of nine and three quarter years, is impressive only for its cheapness. It is estimated

LAND DIVIDED

that the building of the Panama Railroad, in 1850-55, cost that number of lives, and for the Americans to build the world's greatest enterprise in ten years at so low a life cost constitutes for the tropics a profoundly admirable achievement. Whether the government has been economical in the physical construction of the canal may be questioned, but it has been positively parsimonious in the expenditure of human life on the project.

It would be fitting for the first ship to pass through the canal on September 25, 1913, or just four hundred years to the day from the discovery of the Pacific by Balboa. Thousands of Americans may desire to go through the canal on their way to San Francisco's Exposition, a really delightful cruise from New York of eighteen days, but if they do, it will be in foreign ships, because we have no vessels that could handle the traffic. It will be a vivid object lesson of our pitiful lack of a merchant marine.

Less than 100,000 Americans will have seen the canal in course of construction out of a population of 90,000,000. President Roosevelt truly said that a trip to see this great project in the building was more profitable than a trip to Europe. But at the San Francisco Exposition some compensation will be found for a failure to see the canal by an exhibit of every kind of machinery used by the French and the Americans in the thirty-five years of construction, or from 1880 to 1915. When the government finally sold off the old French machinery that had littered the Canal Zone for three decades the best specimen

THE AMERICANS IN PANAMA

of each kind of apparatus was reserved for this graphic exhibit.

Panama now becomes the farthest outpost of Americanism in Latin America. The peoples of that continent have profited immeasurably by the practical demonstrations in sanitation, civil government, and engineering construction. They have learned, and so has the rest of the world, that the tropics are not necessarily deadly, that order can be maintained, not only among a homogeneous population, but among the heterogeneous races that have thronged the Isthmus, and they have seen that no natural obstacle is insuperable before the intelligence of man. The canal should be a means of cementing these lessons, of disabusing mutual prejudices between the Americans to the North and the Americans to the South. The American conquest of Latin America should be more through uplifting ideals than through bald commercialism leading to discord and unbrotherly relations.

CHAPTER II

THE LIFE COST

MEASURED in money, the Panama Canal was to cost \$375,000,000. This is impressive, but there is another item of cost more important, namely, "The Life Cost," or the cost, in human lives, of digging the canal.

Contemplating the record of the Isthmus for unhealthfulness, it could not but be anticipated, in 1904, when the Americans took charge, that this cost would be heavy. That it should be surprisingly low constitutes a more significant achievement than any saving in the money or time cost of the project.

On July 1, 1912, the Americans had been eight years in the actual work of building the canal. In that period of eight years there were:

Deaths from disease.....	4,146
Deaths from violence.....	995
Total deaths.....	5,141

Another full year before the passage of the first ship, and eighteen months before the practical and continuous operation of the completed canal, will bring that total of deaths, estimating on the average of previous years and not considering unprecedented

THE AMERICANS IN PANAMA

increases, to less than 6,000 by January 1, 1914. The Sanitary Department makes the following report for the eight-year period ending July 1, 1912:

Year	No. of Employees	Deaths	Rate per 1,000
1904.....	6,213	82	13.26
1905.....	16,512	427	25.86
1906.....	26,547	1,105	41.73
1907.....	39,238	1,131	28.74
1908.....	43,891	571	13.01
1909.....	47,167	502	10.64
1910.....	50,802	558	10.88
1911.....	48,876	539	11.02
1912 (July)...	48,000	226	10.60

The foregoing figures not only cover those actually at work on the canal, but as well include those who, while not regularly employed, are the wards of the Commission when idle. From 1907 onward health has been normal on the Isthmus, within the Canal Zone, with a death rate, among the Americans, frequently lower than in large centers of population in the United States.

President Roosevelt selected Col. William Crawford Gorgas to clean up the Isthmus because of his record in sanitary work in Cuba and elsewhere. Chief Engineer Wallace doubted his capacity, and so did Secretary of War Taft, but, by 1906, the latter was ready to acknowledge his mistake. Col. Gorgas is a Southern man, a native of Alabama, and so naturally quiet and reserved in demeanor and deportment



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COL. W. C. GORGAS.

LIFE COST

that men accustomed to measure a man by bluster and self-assertiveness make the mistake of assuming that he is not strong. His manner and methods suggest Gen. Robert E. Lee.

There were two prime needs, as Col. Gorgas viewed the Isthmus in 1904, in any campaign for improved health conditions. One was to make the Isthmus clean and the other was to kill the mosquitoes which he considered a means of propagating disease. Practically everything done by the health department has been along these main lines of theory.

The United States profited by the mistakes of the French to the extent of reserving, in the treaty with the Republic of Panama, the exclusive right to control the sanitation of Panama and Colon. So, in 1904, the engineers immediately went to work on a sewer, waterworks, and street-paving plan that would make of these two characteristically filthy Central American cities, clean, decent, sanitary places of abode.

The native population dumped all garbage, and matter usually consigned to sewers, into the streets. These streets were mud holes which, with the admixture of refuse, made a condition inconceivably dirty and naturally unhealthful. The Americans made a reservoir in the mountains a dozen miles away for the water supply of Panama, dug sewers and forced the native houses to connect with them, and then paved the streets with brick. A system of garbage collection was organized, and the city was cleared of all rubbish. To-day the tourist sees some evidence

THE AMERICANS IN PANAMA

of slovenly living, but conditions generally are surprisingly smart.

The second part of the program—killing the mosquitoes—was accomplished principally by the use of crude oil. Every stagnant pool of water, and most of the running streams—except rivers—were treated with oil, and the rank grass and tropical growth was kept cut by hundreds of scythemen. As a further war measure all houses were screened, the amount spent on this item alone amounting to a sum between \$750,000 and \$1,000,000.

Having cleaned up within, rigid quarantine regulations were made to keep out persons who might be brought in a diseased condition from other ports. Vaccination of every person who enters the Canal Zone is compulsory, unless a good scar can be shown. In 1905 a ship load of natives from Martinique, imported to work on the canal, refused to land because they thought vaccination was a plan to brand them so they could never return to their home. They were forced out at the point of the bayonet and vaccinated.

It was before these plans had been matured that the first and only epidemic of yellow fever occurred in the Canal Zone. In April, 1905, an employee in the Administration building in Panama became sick with the fever, and from then on to September the Canal Zone was in the throes of a fear that was featured by the wholesale departure of employees. The newspapers gave the epidemic wide and oftentimes erroneous publicity, with the consequence that the government had to pay for the fear of the Isthmus thus

LIFE COST

created, in greatly increased salaries and gratuities, to secure American employees.

By October, 1905, Col. Gorgas had mastered the epidemic, and, although isolated cases have occurred since, yellow fever was permanently banished as the bugbear of Panama. From July 1, 1904, to November 1, 1905, 44 employees succumbed to this disease. While the epidemic raged, from April to September, 1905, there were 37 deaths among employees, mainly among Americans, with whom the epidemic started.

There was a siege with smallpox and the plague, but they, too, were eradicated in so far as epidemics are concerned, and malaria, pneumonia, and tuberculosis remain as the most frequent attributed causes of death. Quinine has been bought by the ton for the Canal Zone dispensaries and hospitals. In 1908 each employee averaged about an ounce of quinine, and they were advised to take three grains daily.

The French had left hospital buildings in Colon and on the side of Ancon hill, just outside of Panama. The Americans renovated these and added to them until the present vast facilities came into form. They sometimes have more than 1,200 patients. A large asylum for the insane also is maintained. Hospital cars are attached to the passenger trains to bring in patients to the Ancon and Colon hospitals each day. In every town or settlement there is a dispensary with a physician in charge and a sanitary officer to inspect conditions of living. There are about 24 employees out of every thousand constantly sick.

For the Canal Zone, Panama and Colon, in 1905

THE AMERICANS IN PANAMA

the death rate was 49.94 per 1,000. In 1911 it was 21.46, or cut down more than one half. In 1906 the death rate among the Americans from disease was 5.36, and in 1911 it was 2.82. In 1908 and 1910 there were more Americans killed in accidents or died from violence than died from disease.

It necessarily follows, from an engineering task of this magnitude, where vast quantities of explosives are handled, where there is a considerable railroad mileage and other hazardous features of construction, that the death rate from violence or accidents would be large.

Every month since the American occupation began in May, 1904, there has been an average of 10 employees killed or have died from external causes. The total to July 1, 1912, was 995, and by the time the canal is completed, barring unusual catastrophes, the deaths from this cause will be around 1,100. Under the head of violence are included deaths by drowning, suicide, dynamite explosions, railroad accidents, poisonings, homicides, electric shocks, burns, lightning, and accidental traumatism of various kinds.

Scores of deaths have resulted from the practice of the native employees in using the railroad tracks as public highways. There have been bad collisions and wrecks with fatalities, and dynamite has claimed about one tenth of the victims of external violence. In the handling of 25,259 tons of dynamite, or 50,-517,650 pounds, to July 1, 1912, the following principal accidents have occurred:

December 12, 1908, at Bas Obispo, premature ex-

LIFE COST

plosion of twenty-two tons in the Culebra cut, 26 killed and 40 injured.

October 10, 1908, at Mindi, 7 killed and 10 injured, premature explosion. Dredging in Pacific entrance.

October 8, 1908, at Empire, in the Culebra cut, 5 killed and 8 injured, premature explosion.

August 30, 1910, at Ancon quarry, 4 killed.

July 19, 1911, at Ancon quarry, 4 killed, 2 injured.

January 10, 1909, at Paraiso, 2 killed, 10 injured.

July 25, 1909, on Panama Railroad, 4 killed, 9 injured.

May 22, 1908, in Chagres division, 2 killed, premature explosion of twenty-six tons, caused by lightning.

Forty deaths from dynamite explosions are noted for the year 1908, the largest number for any one year of canal construction, and this does not take into account several individual fatalities. Chief Engineer Goethals issued stringent regulations to govern the handling of the dynamite, but it was in such common use that the employees naturally became careless. An instance is afforded by two employees who knocked an iron pipe against a railroad track to dislodge some dynamite. They were angels in less than two seconds after the first blow. The worst accident, at Bas Obispo, has not been explained.

Most of the accidents have occurred since the working force has been in excess of 20,000 men. When the number killed outside the line of duty is sub-

THE AMERICANS IN PANAMA

tracted from the total deaths by violence, it will be found that the actual building of the canal has been attended by a normal percentage of such fatalities—certainly no larger than in any private construction of the same character or approximating the same magnitude. The largest number of deaths by violence among employees in one year was in 1909, when 178 were killed, and this was equaled again in 1911. The following table shows the number of American employees, the total death rate, and the relation of deaths from disease to deaths by violence from 1906 to 1911, inclusive:

YEAR	No. of Empl'y's	Death Rate Per 1,000	By Disease	Violence
1906.....	3,264	8.14	5.36	
1907.....	5,000	8.14	5.36	
1908.....	5,126	8.19	3.70	4.49
1909.....	5,300	5.56	3.23	2.33
1910.....	5,573	5.35	2.43	2.92
1911.....	6,163	5.14	2.82	2.32

Col. Gorgas found, in the early years of canal work, that the Americans and Europeans were three times as healthy as the natives of the tropics, who, as Chief Engineer Stevens noted in 1905, "are supposed to be immune from everything, but who, as a matter of fact, are subject to almost everything." This somewhat upsets the theory that northern races cannot live readily in tropical climates.

Several of the annual reports of the Sanitary Department have noted the remarkably few diseases

LIFE COST

peculiar to men, such as alcoholism, etc. Mr. Tracy Robinson, in his book of personal reminiscences, "Fifty Years at Panama," speaks authoritatively on the use of liquor in the tropics as follows:

"Many foreigners have fallen victims to fear rather than fever; while many others have wrought their own destruction by drink, which is the greatest curse of mankind in all lands, but more especially in hot countries. It has killed, directly and indirectly, more than the entire list of diseases put together; for it induces by its derangement of the vital forces, every ill to which flesh is heir. Candor compels me to state that I have tried both abstinence and moderate indulgence; and when it is said that strong drink is necessary in the tropics to tone the system up, or for any good purpose under heaven, I say emphatically, it is not so! It is absolutely best to let it entirely alone. My fifty years' experience gives me authority to write as I do."

Allowance must be made, in considering the favorable health showing on the Isthmus, to the fact that the employees in one sense are picked men. They must be in sound condition when employed and usually in the prime of life. Another thing that has kept the death rate down among the Americans has been the practice of returning to the United States many patients who apparently had not long to live.

THE AMERICANS IN PANAMA

Thus their deaths were not a charge against the Canal Zone.

It cannot be assumed that all the deaths from disease in the Canal Zone were from causes that originated there. The diseases peculiar to the tropics have not claimed as many victims among the Americans as the diseases peculiar to the northern climates. But there has been a steady improvement, as may be noted in a fall in the death rate among the Americans, from 8.14 per 1,000 in 1907 to 5.14 per 1,000 in 1911.

An incident in the sanitary government of the Isthmus was an Executive Order by President Taft, effective on December 12, 1911, which prohibited the practice of any system of therapeutics or healing that the Sanitary Department, the allopathic school, should rule against. The President, upon its possible application to create a monopoly of healing in the Canal Zone being pointed out to him, revoked the order on January 1, 1912.

Employees are not permitted to remain in their homes or quarters when sick, but must go to the Colon or Ancon hospital, unless the district physician expressly rules otherwise. The hospital grounds at Ancon are beautiful, and convalescent patients are sent to Taboga Island, ten miles out in Panama Bay, for final treatment. A dairy with 125 cows supplies fresh milk to the Ancon hospital.

At first Col. Gorgas was not a member of the Isthmian Canal Commission. But the extraordinary ability he displayed resulted in the separation of the Sanitary Department from the jurisdiction of the Gov-

LIFE COST

ernor of the Canal Zone, and on February 28, 1907, Col. Gorgas was made a member of the Commission, with the Department of Sanitation having equal dignity with other grand divisions of the work. He is the only official of the highest rank who has been with the canal project from its earliest days to the present.

The cost of the sanitary conquest of the Isthmus, to July 1, 1912, was the somewhat impressive total of \$15,000,000. Here, as in the pay and treatment of employees, the government has sought results without regard to the expense. For the remaining days of the canal the cost of sanitation will be approximately \$2,500,000, or \$17,500,000 in all by January 1, 1914, which amount is nearly \$3,000,000 less than the cost estimated for the department in 1908.

The first grand lesson from the life cost of the Panama Canal is that the tropics no longer offer insuperable obstacles to the health of northern races. For all South and Central America the work of the Americans in Panama teaches the imperative necessity of a literal belief in the old adage: "Cleanliness is next to Godliness." At every single point where disease has dominated the situation, it has been found that filth abounded. Guayaquil, in Ecuador, sometimes is quarantined half the year, and it is a significant fact that this has been one of the dirtiest ports in South America. Any people who are willing to live indecently will pay the penalty in a high death rate.

When the ordinary cleanliness to which the American, or the European, is accustomed is observed in the tropics, and if intoxicants are not permitted to

THE AMERICANS IN PANAMA

dominate the individual life, there will not be the slightest difficulty in living near the Equator. The ultimate crowding of North America will force population into Central and South America, and among the world benefits of the Panama Canal none is more flattering to the Americans than just this lesson that he who will live decently may live healthfully.

CHAPTER III

THE SPANISH IN PANAMA

HISTORIANS have noted that certain members of the vegetable and mineral kingdoms have played a vital part in the discovery and colonization of the Americas.

Columbus, the master spirit of his age, had the noble, imaginative conception of the earth's rotundity which he wished to demonstrate to mankind, but his immediate impulse was to find the shortest passage to the East Indies, where the spices so much prized on the dining tables of Europe could be obtained and brought back more expeditiously than by the long trip around the Cape of Good Hope.

To the North, more than a hundred years later, tobacco was the main product that held the English colonists to Virginia in the face of hostile savages and exile from home. Smoking spread over Europe like an epidemic, making the rewards from the cultivation of the weed immediate and profitable from the start.

The members of the mineral kingdom which held the venturesome mariners to their new found lands, despite every discouragement, human and natural, were gold and silver. No sooner had these precious metals crossed the European vision than their first love, spices, faded completely out of the imagination.

THE AMERICANS IN PANAMA

Thenceforth, the Spaniards and the Portuguese ransacked an isthmus, a continent, and the islands of the sea with frenzied and appalling barbarities and with splendid success.

Thus spices, tobacco, gold, and silver have been the unheroic causes of epochal movements in the human family. Columbus kept his vision above the sordid greed for gold to the last. On the fourth attempt he made to find a passage to the East Indies he cruised along the Isthmian coast from September, 1502, to January, 1503, entering and naming the harbor of Porto Bello on November 2, 1502, and visiting Nombre de Dios on November 9th, in what is now the Republic of Panama.

Columbus, however, was not the discoverer of Panama, as a Spaniard, named Rodrigo de Bastides, had preceded him to this coast, in 1501, so that the period of the Spanish in Panama dates from that year. Bastides visited Nombre de Dios, where eight years later the first Spanish settlement on the Isthmus was planted, in 1509, as a base for the search for gold.

Vasco Nunez de Balboa had been with Bastides on his trip of exploration and he became the head of the new colony at Panama. It had been designated "The Castle of Gold" by the King of Spain because of the plentiful quantities of that metal found among the natives. For a few years the mountains with their dense jungle growth stood as a barrier to explorations farther inland, but the stories of the marvelous wealth of the inhabitants on the other side, told to Balboa by the Indians, so excited his

SPANISH

cupidity that, in 1513, he gathered a band of 190 men and started across.

When they approached the summit of a mountain which, the Indian guide said, would afford a view of the new sea, Balboa ordered his men to halt while he alone took the first view. There, in the heart of the Isthmian jungle, four hundred years ago, with what must have been a feeling of awe even to his hardened nature, Balboa discovered the Pacific, on September 25, 1513. Calling his men to him, they had a religious ceremony, claiming all they surveyed as the dominions of His Majesty, the King of Spain. Four days later, after traversing the distance to this sea from the mountain, he waded out into the water and reaffirmed his sovereign's title.

Gold he found in abundance, and pearls of fabulous size and value. After five months' absence, he returned to Nombre de Dios by a more direct course, and spread the news which was to turn Central and South America into a slaughter house, through the mad traffic that debauched Spain, made pirates of England's navigators, and reduced the original population to wretched slavery.

Balboa found that he had been succeeded as Governor at Nombre de Dios by a soldier named Pedrarias. Between them a hatred sprang up which, in 1517, resulted in the untimely and unjust execution of Balboa on trumped up charges. Prior to this, Balboa had made other trips to the Pacific, carrying across with incredible labor the parts of ships which were rebuilt in the Pacific. In 1911 the Americans

THE AMERICANS IN PANAMA

found a cannon of immense weight about halfway across, which evidently had been abandoned by Balboa, and an anchor of great size also has been found.

Pedrarias, in 1515, had sent exploring parties to the Pacific side to select a site for a settlement on that coast. The San Francisco Exposition, therefore, in 1915, will be exactly four hundred years after this event. It was not until 1519 that the settlement was started, and the founding of the city of Panama dates historically from that year.

With the founding of a town on the Pacific side began the interoceanic traffic which ever since has emphasized the need of easier and swifter communication between the Atlantic and Pacific. The site of the city was about twelve miles from the present city of Panama, and a few miles inland. At a huge expense of labor and life a paved road was constructed from Nombre de Dios to Panama, portions of which may be seen in the Canal Zone to-day. Another route across the Isthmus followed the Chagres River as far as it was navigable to a point near the American town of Gorgona, from there the trip being across the mountains to Panama.

It may be noted that Panama was founded a full one hundred years before the landing of the Pilgrims at Plymouth. Nombre de Dios was a town ninety-eight years before the first English settlement in North America, at Jamestown, in 1607. Saint Augustine, Florida, the oldest town in North America, was not founded until forty-six years after Panama. Indeed, Panama is the oldest part of continental America.

Francisco Pizarro, a pupil of the Balboa school, heard tales about an indescribably rich country south of Panama. He organized an expedition, which left Panama in 1532, and effected the conquest of Peru, which Prescott has immortalized in literature. History does not afford a more daring, a more barbarous, and scarcely a more richly rewarded conquest, nor does Europe or Mexico present a more interesting prehistoric civilization than the land of the Incas.

After nearly a century at Nombre de Dios, the Spanish, in the year 1584, found Porto Bello a healthier site for a settlement, and moved bag and baggage to that incomparable port. In leaving Nombre de Dios, it is worth recording that Sir Francis Drake, the great Englishman who had "singd the King of Spain's beard," who had plundered the Spanish Main from boyhood, and had circumnavigated the globe, claiming California for his Queen, died on board ship and was buried at sea off Nombre de Dios in 1596.

Porto Bello at once became the depot of Spanish treasure, accumulated from Peru or other South and Central American countries, and brought across the Isthmus from Panama with incredible hardship. From this port the Spanish galleons ran the gauntlet of English pirates to Spain. Drake had been one of the most intrepid of this crew. Henry Morgan, a century later, was another. The English allowed the Spanish to perform all the arduous labor and fighting involved in acquiring the gold and silver, then hovered around the West Indies and took it from them, or died in the attempt.

THE AMERICANS IN PANAMA

In 1668, Henry Morgan collected a motley crew of sea vagabonds with the object of capturing Porto Bello. The operations of the English buccaneers usually were plain piracy, but they justified themselves in their own minds by the quarrelsome state of the relations between England and Spain, and a still deeper motive was the implacable warfare between Protestant and Catholic. Morgan, as unprincipled a soldier as ever fought, was knighted for his piracies in Panama.

Porto Bello was captured after a fight not surpassed in history for inhumanities. The treasure they found here whetted their lust for gold, with the result that, three years later, a still bolder enterprise, that of traversing the Isthmus and taking Panama, was planned. In 1671 Morgan started up the Chagres River with 1,600 men, and, after abandoning that stream, they struck out overland to Panama. Nine days were consumed in the journey with hardships from hunger and the labor of penetrating the jungle, the like of which have not been exceeded by soldiers anywhere.

When they did get in sight of Panama they were so weak that a more resolute foe easily could have annihilated the army of invasion. The Spanish and natives kept within their fortifications and their first offensive move was to attempt to stampede two thousand bulls upon Morgan's men, who promptly quit fighting to slaughter enough of the animals to satisfy their hunger. Thus what might have been a formidable

SPANISH

defensive act, if successfully managed, was turned to vital advantage by the enemy.

A desperate defense was unavailing. The city was captured, but found to be barren of treasure, as the Spanish had loaded a ship with their gold and silver before the attack began, and the ship could not be found. It was an unwise move, because the infuriated pirates proceeded to torture the people, and to murder hundreds, finally burning Panama to the ground. To-day tourists go out to see a tower and other ruins of the famous old city of Panama.

Panama was rebuilt on a short promontory in the Pacific, and although captured again by the pirates in 1680 has remained on the new site to this time. Many vicissitudes attended the career of the Spaniards for the following century and a half, the chief ruffle on their calm being an effort by William Paterson, a wealthy Englishman, to found a colony of Scotchmen in the Darien region on the Atlantic coast, east of Porto Bello. The first colony of 1,200 came in 1698 and perished from disease or fighting, and a second company of 1,300 followed the same course, being expelled or killed by the Spanish, so that not more than thirty ever returned to Scotland. It was a lamentable failure of English colonizing south of the American colonies, and was not followed by other experiments in Panama.

During all the stirring years in Panama the Spanish had swarmed over Mexico, Central America, and South America. Yet, early in the nineteenth century the great colonial empire began crumbling away.

THE AMERICANS IN PANAMA

Province after province revolted from Spain. The explanation is that the Spanish never looked on America as anything other than a place to extract gold and silver. This attitude enabled them to secure the most wealth in the shortest time, but the methods employed, and the treatment of the natives, laid the foundation in unstable elements. In North America regular agricultural and commercial pursuits caused English civilization to take deep root, but, in justice to Spain, it at least is true that she maintained her authority over her colonies as long as England did over hers.

Panama, in 1821, caught the spirit of revolt, and accomplished her freedom from Spain in a bloodless revolution. It then joined the Confederation of New Granada, the Colombia of to-day, under Simon Bolivar, South America's great soldier and statesman. Here ended the career of the Spanish in Panama.

Easily the most impressive fact in all the Western Hemisphere is the achievement of the Spanish in dispossessing a whole continent of its original tongues and substituting therefor their own language. With the exception of some Portuguese colonies, the language of the Castiles is the language from the Rio Grande to Patagonia. The customs also are Spanish and so is the religion. The explanation of this truly remarkable fact is that the Spaniard absolutely refused to adapt himself to the native tongues, customs, or religion, forcing them to conform to his. But the chief credit for this achievement belongs to the missionaries of the Catholic Church, men no less

SPANISH

daring than the conquerors with whom they went hand in hand, planting missions and churches in the jungle. These indomitable priests taught the native children to speak Spanish, and in the course of centuries it became the continental language.

What will be the future of English in Latin America? It is not a wild prophecy to assert that in another generation Spanish will be decadent and English everywhere ascendent. Already the higher social and business circles are acquiring English. In every center of population it is making rapid headway, though it must be many years before the mass of the people make it their own. The South American youth is not dreaming of Europe, but of the giant young republic to the North. He wants to see its skyscrapers, its dazzling luxury in every phase of life. Its politics fascinates and amazes him. It seems a land literally rolling in wealth, the land of opportunity and the land where he may learn the arts with which to make a career in his own country. The Americans are as loath to adapt themselves to Spanish customs and dialects as the Spaniards were to the original. Every year Americans find it less difficult to get about anywhere in Latin America. English ultimately will triumph from Alaska to Magellan Straits, and the canal will speed the day.

CHAPTER IV

THE PANAMA RAILROAD

KENTUCKY'S great statesman, Henry Clay, as Secretary of State in 1825 and as Senator in 1835, was interested farsightedly in plans for speedier communication at the Isthmus between the two oceans. The independence of Panama from Spain by a bloodless revolution in 1821 had placed the Isthmus in a new position for other European governments, or the United States, to negotiate terms for concessions. The American people were jealous of foreign activities, but not aggressively active themselves in concrete efforts toward a canal.

De Witt Clinton, prominently connected with the Erie Canal, headed a company that sought government aid in its plans for a canal in Central America, but though Clay encouraged the idea nothing definite resulted. The year following, or in 1826, Simon Bolivar, South America's great soldier and statesman, invited the United States, among other American republics, to an international conference in Panama with the object of forming a union for the promotion and defense of all American interests.

While nothing significant came of this congress, it is noteworthy as the first attempt to form what is now the Pan-American Union, or the Bureau of American Republics, at Washington. It assembled on

RAILROAD

June 22, 1826, but the United States representatives did not arrive in time to participate.

Panama had become a part of the confederation of New Granada after independence from Spain, and thenceforth lived the regular life of a turbulent province of what to-day is known as Colombia. All the commerce between the coasts drifted across the Isthmus at that point. Little effort had been made to improve the passage, so that swifter and easier communication was the dream of every seaman or traveler.

Clay introduced a resolution in the Senate in 1835 authorizing President Jackson to appoint a commissioner to investigate the feasibility of a rail or water route at the Isthmus. Charles Biddle undertook the mission and secured a concession at Bogota, the capital of New Grenada, but he died before making a report. President Van Buren interested himself in the project, but little came of American plans for the next ten years.

The ever alert French, in 1847, after securing a concession to build a railroad, allowed it to lapse. It is significant that this French failure was followed, as in the case of trying to dig a canal, by a successful attempt by the Americans.

Three Americans, William H. Aspinwall, John L. Stephens and Henry Chauncey, of New York, taking advantage of the opening made by the French failure, obtained a concession from the Bogota government in 1849 for building a railroad across the Isthmus at Panama, with the important provision that no canal

THE AMERICANS IN PANAMA

could be constructed there without the company's consent.

Their concession was for a period of forty-nine years after the completion of the railroad, but Colombia reserved the right, twenty years after its completion, to purchase the road for \$5,000,000. The unprecedented prosperity of the road immediately upon the beginning of its operation made this latter provision a bad stroke, as in 1875 Colombia could take it over at the fixed valuation. The company began to seek an extension of the life of the concession, with Colombia, unfortunately for it, holding the whip hand.

Negotiations were concluded in 1867 whereby a ninety-nine year concession was obtained, but the terms were very hard. A cash bonus of \$1,000,000 had to be paid to Colombia, with an annual payment of \$250,000 and the company agreed to extend the railroad out into the Pacific Ocean to some islands where deep water would enable large ships to dock.

Luckily for the American promoters, the discovery of gold in California in 1849 came just as they were seeking to float their company. The Isthmian route to California at once became heavily traveled and the eyes of the whole world, particularly of the United States, were again fastened upon Panama.

Our government in 1846 had concluded a treaty with Colombia which provided for the joint construction of a canal in Panama, and the stimulated interest in the Isthmian route in 1849 made this appear a fortuitous treaty, because it excluded any European power from that territory. A controversy arose be-

RAILROAD

tween the United States and England over the Nicaraguan canal route, culminating in a treaty between the two governments known as the Clayton-Bulwer treaty of 1850. This treaty provided substantially the same as the Colombian treaty of 1846, that in the event of the construction of any canal in Central America, Great Britain and the United States guaranteed its neutrality and use on equal terms to all the world.

The addition of the territories of Oregon and California to the United States still further emphasized the need of quick communication between the Atlantic and Pacific. The Panama Railroad, therefore, took hold upon the popular imagination.

Aspinwall and his associates pushed the construction of the road under James L. Baldwin, an American civil engineer of uncommon ability. Labor of a desirable kind was not obtainable. Many nationalities were tried, with a tragic failure on the part of the Chinese, who seemed unable to face the terrors of the jungle. Hundreds committed suicide, and disease and accidents claimed other hundreds. The life cost of the Panama Railroad in the five years it was building has been estimated at 6,000 persons.

The route selected started at an island near the coast on the Atlantic side, the site of the city of Colon, crossed the hills into the valley of the Chagres River and followed that valley to the continental divide, over which it passed with a maximum elevation of 263 feet above sea-level, and thence down to Panama on the Pacific side. Treacherous swamps, almost impenetrable jungles, and formidable streams and mountains

THE AMERICANS IN PANAMA

necessitated incredibly hard labor and continuous work from 1850 to January 28, 1855, when the first train reached Panama from Colon. The line was forty-seven miles long, built of Belgian rails and on a gauge of five feet.

The standard gauge in the United States is four feet nine and a half inches, so that all locomotives and cars used on the Panama railroad have to be specially built with wheels set farther apart. When it comes to disposing of surplus equipment after the canal is finished, the government will have to allow for the cost of modifying the rolling stock from the five-foot to the standard gauge. It is estimated that the axles on locomotives may be shortened at an average cost of \$750 a locomotive, and for cars, from \$27 to \$31 each.

California gold-seekers used the railroad as far as it was built during the years immediately following 1850 and made the rest of the trip across the Isthmus by muleback. There were no buccaneers waiting to relieve them, as they had the Spaniards, of their treasure, but bandits and outlaws haunted the route with almost equal success. Thus the railroad had an income from the start, and ten years after completion it was known as the best-paying property in the world.

The total cost had been \$7,407,553, or about \$158,000 a mile. Dividends were paid every year from 1853 to 1892, and from 1901 to 1903, when it became United States property. The largest year's earnings was in 1868 when 44 per centum was paid, or \$4,337,668.48 in both dividends and undivided profits. Total

RAILROAD

earnings from 1855 to 1898 were \$94,958,890.36; operating expenses, \$57,036,234.46; leaving for surplus and dividends, \$37,922,655. Rather eloquent figures as to the Isthmian freight and passenger traffic!

The great prosperity of the railroad suffered a serious set-back with the completion of the California overland railroad in 1869. Thenceforward the valuable bullion shipments avoided Panama as well as passenger and freight business. The company's business shows a steady decline from that year, and some wooden-headed management contributed to the momentum. Still it was a valuable property, and to the French a very expensive property, as they found in 1881, when they had to buy the railroad in order to obtain a concession to build a canal.

Colombia turned to the French, after negotiating fruitlessly with the United States over a canal concession, and the company headed by M. de Lesseps was granted a right of way provided the railroad would suspend the provision in its concession giving it the say-so as to water communication. Freight rates were boosted on all French company shipments until in desperation they bought the road for \$18,094,000, in 1881, paying considerably more than it was worth, or \$250 a share for sixty-eight seventieths of the capital stock.

The French neglected the commercial possibilities even more than the American owners had, though dividends were earned during the life of the first company. When the United States bought the interests of the French company, in 1904, the Panama Railroad

THE AMERICANS IN PANAMA

was one of the properties transferred. It was sadly run down, but under the Americans it was made over into a modernly equipped and operated system, though subordinated as a commercial proposition to the construction of the canal. Chief Engineer Wallace suggested that it be double-tracked, or four-tracked, and up-to-date ocean terminals for handling a great freight business be built, with the idea of supplying cheap and swift transit pending the completion of the canal, but this view was abandoned by succeeding engineers, until in 1912 the Secretary of War cut down the amount of commercial business the road should handle so that canal shipments might have uninterrupted right of way.

Doubtless mahogany, ebony and other rare hard woods have not been used in cutting ties for other railroads, but the Americans have dug up ties of those woods that had been in the ground sixty years and still were in good condition. The quaint hollowed out Belgian rails had to be replaced with heavy American types. Such rolling stock as was used by the Americans was for light hauling.

Passenger rates dropped from \$25 a one-way ticket in 1855 to \$2.40 under the Americans to-day. The trip from Colon to Panama is two hours and a half and the coaches are painted yellow because that color best stands the Isthmian climate. In the fiscal year ended June 30, 1911, the Panama Railroad under American control earned \$2,398,177.88 from freight and \$686,991 from passenger business. The number

RAILROAD

of passengers carried during the year was 2,999,500, and in 1912 a larger traffic was recorded.

The plans for the canal as adopted by the Americans in 1906 played havoc with the right of way of the railroad, so in June, 1907, the work of relocating it back among the hills out of reach of Gatun Lake was begun. After five years' work, or as long as it required to build the original line in 1850-1855, the new line was opened to traffic in 1912. The full line, however, was used only for freight trains, as the Canal Zone towns mostly are on the old line, along the Culebra cut.

This twentieth century Panama Railroad has cost \$9,000,000, as compared with the cost of the nineteenth century road, \$7,000,000, an increase of \$2,000,000 after a lapse of sixty years. On the face of things the performance in 1850-1855 seems more creditable than in 1907-1912, because then a pathless jungle had to be conquered when the Isthmus was a death trap; whereas now the Americans had a force of workers organized, they had the equipment on the ground with which to do the work and the entire resources of the canal organization as to quarters, subsistence, and medical attention were within easy reach. Not considering the cost, the relocated line is a beautiful piece of engineering work.

The dream of a Pan-American Railroad has been entertained ever since steam locomotion came into use. When several gaps are filled in, there will be railroad communication through Mexico, Guatemala, and Nicaragua to Costa Rica, which adjoins Panama. The

THE AMERICANS IN PANAMA

Republic of Panama has been planning an interior railroad system that would be part of an all-rail route from the United States to the canal. Before many years it is likely that a bridge will span the canal in a railroad system that reaches from Canada through Panama to the mainland of South America, thence down the West Coast to Valparaiso.

In connection with the railroad, the government has operated a steamship line to New York, from Colon, the fleet at present consisting of six ships, the *Ancon*, *Cristobal*, *Panama*, *Colon*, *Advance*, and *Allianca*. These ships have transported the larger part of canal supplies from the Atlantic seaboard. Canal employees get passenger rates of \$20 or \$30 for one-way trips when taking vacations, and other steamship lines grant smaller reductions. The regular rate from New York is \$75. It is the only line to Panama that flies our flag.

CHAPTER V

THE FRENCH IN PANAMA

OPINIONS as to the advisability of an Isthmian canal ran all the way from the attitude of Philip II, of Spain, that it would be impious to tamper with natural land configurations as arranged by Providence, to the bold determination of the French to do at Panama what they had done at Suez.

Ferdinand de Lesseps and his Panama career vindicate strikingly the truth of the adage that nothing succeeds like success. The French Panama Canal Company was floated on the strength of his achievement in cutting a sea-level passage from the Mediterranean to the Red Sea, thus making an island of Africa.

When he turned his attention to Panama as a new field for glory, the French people enthusiastically applauded his audacity and, what is more significant and substantial, invested, first and last, \$265,000,000 in the enterprise. American capital entered practically not at all into the French project, and not a great deal of outside European capital, the French middle and peasant classes being the principal shareholders.

There had been talk and paper negotiations aplenty before M. de Lesseps became active. In 1838 a French syndicate sought to interest their government in the enterprise but the plan fell through, and the failure

THE AMERICANS IN PANAMA

later of the French companies to build the canal cannot be censured as a failure of the French government, which never financed it as a national enterprise as has been done in the successful American attempt.

President Simon Bolivar, of New Grenada, or Colombia, in 1827, had ordered a study made of the Isthmus to ascertain facts about a route for a canal or railroad. Any concession that might be granted must come from his government. The various American nibbles at the idea have been noted, and as a way of stirring us up to real action, Colombia paid assiduous court to France. Gen. Stephen Turr, a native of Hungary, in 1876 obtained a concession, in association with Lieut. Lucien N. B. Wyse, who figured prominently in all the later French operations. Count de Lesseps was interested by Wyse who, in 1878, revived the concession on the following terms: Its life was for ninety-nine years after the completion of the canal, allowing two years to organize the company and twelve years in which to dig the canal. Colombia was to receive \$250,000 annually after the seventy-sixth year of the life of the concession and it expressly was stipulated that though the French company might sell to other private companies, it could not sell out to any government, a provision which played a vital part in the transactions leading up to the American control in 1904.

The French were theatrical in their plans for launching the enterprise. A world congress of engineers was invited to assemble in Paris in May, 1879, to decide upon the type and cost of the canal. M. de

FRENCH

Lesseps presided and guided the decision to a sea-level type, the same as at Suez. There were eleven Americans in the assembly but this was the extent of American interest. It was at this congress that the first suggestion of a dam at Gatun for a lock-type canal was made by Godin de Lepinay, a French engineer. The sea-level advocates advanced the plan of digging a great tunnel for ten miles through the Cordilleras and so divert the Chagres River into the Pacific Ocean away from the canal, as that river was useless in a sea-level type.

Under the stimulus of these proceedings, the new company's stock was over-subscribed by the admiring countrymen of the great de Lesseps, the first issue being for \$60,000,000. M. de Lesseps then made a spectacular trip to Panama, arriving at Colon on December 30, 1879. The Panamans and foreign colony received him with wild acclaim as the forerunner of a golden stream of money about to enrich their country, and as the first concrete step toward realizing the dream of four centuries.

The first blast of an explosive in the construction of an Isthmian canal was set off by one of the young daughters of M. de Lesseps at Culebra on January 10, 1880. After several weeks of banqueting, Count de Lesseps left for the United States to stir the imagination of the Americans over the enterprise. About the only result was to attract the attention of some contractors to the work, notably in the case of the Slaven brothers who, previous to their Panama adventure, had seen no experience in construction work, but who

THE AMERICANS IN PANAMA

did the most creditable work on the project, dredging thirteen miles, making fortunes for themselves and leaving machines which the Americans repaired and used from 1904 onward.

As estimated by M. de Lesseps, the sea-level canal was to cost \$131,600,000, although the Paris congress had gone higher in its figures. He was, of course, sadly mistaken in this estimate and the French ultimately spent twice that amount before throwing up the sponge. Conditions totally were different from those at Suez. There the sandy dunes rose no higher than forty feet above sea-level at any point and excavation work comparatively was easy. In Panama a mountainous configuration with solid rock a short depth beneath the surface had to be faced, with torrential streams to be controlled and diverted.

Operations went ahead rapidly from 1880 onward, the method being to let contracts for the different phases of the work. The canal started near Colon, in Limon Bay, and was to follow the valley of the Chagres River for about thirty miles, thence through the continental divide to the Pacific, three miles west of Panama, about where the present canal begins.

By 1885, however, extravagance and graft had emptied the company's treasury. The contractors, as a rule, did little and exacted much. It became apparent, too, that a sea-level type presented staggering difficulties. M. de Lesseps gave his consent to a change in plans to a lock type, as had been recommended by the engineer Lepinay, but the dam was to be at Bohio, instead of at Gatun. Bohio is seven-

FRENCH

teen miles from the Caribbean, while Gatun is only seven miles distant from that sea.

All the theatrical methods conceivable were employed to float a new bond issue for \$160,000,000, but the public had grown dubious over the success of the enterprise. The amount was raised, however, and was poured into the project with more millions until 1889 when, after \$234,795,017 had been invested, the company became bankrupt. Of this vast amount, \$157,224,689 had been invested on the Isthmus, the remainder having gone to organization expenses, for promotion, and overhead expenses generally. For engineering and construction, \$89,434,225 had been spent; for machinery and materials, \$29,722,856; for buildings, hospitals, etc., \$15,397,282. Various needs and graft absorbed the rest.

The French treated their white employees with extravagant generosity. Living accommodations were on a scale of open-handed liberality. Little was done, beyond building hospitals, to conquer the bad health conditions of the Isthmus, and, while the French left patterns for much of the later American activities, the sanitary control of the jungle distinctively is an American triumph. The death rate among French employees on the canal was from two to three times as high as under the Americans.

Older natives in Panama still speak of the period of French operations as the "temps de luxe." M. de Lesseps was charged with fraudulent manipulation of the company's affairs, but escaped punishment for his alleged wrongs. There was graft everywhere, and

THE AMERICANS IN PANAMA

when the Americans invoiced the property left by the French they found stores of articles that had been bought in quantities absurdly beyond the needs of the enterprise. The purchase of the Panama Railroad, while at a high figure, was the only investment by the French that approximated sound judgment.

In 1890, an extension of ten years to the time for completing the canal was granted by Colombia, and subsequently extensions were permitted that advanced the life of the concession until October 31, 1910. A new Panama Canal Company was organized in 1894 with a capital of \$13,000,000, and while it spent this amount and more, it never attained the momentum of the first company. The maximum force under the first company was 25,000 men and under the second régime 3,000.

The total excavation by the French in Panama was 78,000,000 yards, of which the first company took out 65,000,000 yards. Between Gold Hill and Contractors Hill, where the surface at the center line of the canal was 312 feet above sea-level, the French dug down 161 feet, this being the deepest cut they made. It is here that the work they did was useful to the American plans for a canal, but out of all their work only 29,908,000 yards were excavated from the present American route. For years before the Americans came the French did just enough work to keep their concession alive.

Summing up, the efforts of the French in Panama were a lamentable failure, but it probably is true that a private company of any nation would have met the

FRENCH

same fate. The riot of graft that attended the French effort is its chief blot, just as the honest construction of the canal by the American government is its chief honor. Indisputably, the French efforts made the American effort easier. Much that they did stood as landmarks to guide our way. Much that they failed to do emphasized the work cut out for us before success could be attained.

The mechanical equipment we took over from the French, the houses and hospitals, and especially the engineering records, were invaluable from the start of American operations and much still is in use. In 1912 there were 112 French locomotives, seven ladder dredges, hundreds of dump cars, machine-shop equipment, and other materials in profusion actively employed in canal construction.

An effort was made by the French company in 1898 to interest the United States government in the enterprise, provided permission could be secured from Colombia, but this failed, and the plan of 1903, for turning the property over to the United States, was its successor.

To-day, as one views the abandoned French equipment, overgrown by the luxuriant tropical vegetation, he is reminded of the retreat from Moscow. The quaint locomotives and machinery lying desolate and rusting away suggest the batteries that Napoleon left in the Russian snows. Indeed, there was much of the same exquisite French dash about the two enterprises that ended so disastrously.

CHAPTER VI

THE AMERICANS IN PANAMA

FOREIGN activities in Panama were watched, officially and unofficially, by the Americans with profound interest, and with a desire that the construction of a canal should be the work of the United States. The thought of communication between the oceans being in European hands was distasteful to our statesmen.

The Monroe doctrine seemed broad enough to shut out foreign governments, but not private corporations of such governments, from acquiring the territory through which to dig the canal. However noisily the Monroe doctrine might be flaunted by the orators of the United States, our international position in 1850 did not give it anything like the weight that has attached to it ever since the Spanish-American War woke Europe to our strength.

In 1852, when the Panama Railroad was being built, a captain of a company in the Fourth Regiment of Infantry, Ulysses S. Grant, crossed the Isthmus at Panama, on his way to the new California post. There were 1,800 men in the command, which arrived at Colon on July 16th of that year. They used the new railroad as far as it had been constructed, twenty or thirty miles, and the remainder of the trip was by the traditional mule-back system. An epidemic

AMERICANS

of cholera broke out, costing the lives of 80 men, and the general hardships of the transit deeply impressed Captain Grant with the need of a better passage.

Several American exploring parties had been on the Isthmus, and, in 1854, Lieut. Arthur Strain, with twenty-seven companions, attempted to penetrate the jungle. They got lost, and after ninety days of living death he and two or three of the men reached Panama. Every fact that was secured about the geography of Panama by any nation cost human life.

President Lincoln, in 1863, when he was freeing the negro slaves, cast his eyes upon the Chiriqui province of Panama as a suitable place for colonizing the negroes of the South after the Civil War, but his untimely death prevented the opportunity to work out this idea.

The Senate, in 1866, asked Secretary of the Navy Welles to supply it with information as to the feasibility of a canal through the Darien region of Panama. Admiral Charles H. Davis a year later reported adversely to this route which, although the narrowest place on the Isthmus, had a mountain barrier with an elevation of 700 feet to make a sea-level canal an impossible undertaking.

That Captain Grant, who had crossed the Isthmus in 1852, became President in 1869, and the very same year he directed Gen. Stephen A. Hurlbut to negotiate a treaty with Colombia for a Panama canal. He knew from experience how advantageous it would

THE AMERICANS IN PANAMA

be to his country. Such a treaty was signed at Bogota on January 26, 1870, but the United States Senate did not ratify it and the Senate of Colombia mutilated it. Somehow the two governments did not get along well in those days.

President Grant then sent Admiral Ammen to Nicaragua to investigate that route, more in a pique at Colombia than from a belief in its availability. Colombia returned the feeling by turning to the French and giving Lieut. Wyse a concession. At the instance of President Grant the Panama route again was surveyed by Commanders E. P. Lull and T. O. Selfridge, at the Chagres River and in the Darien region, in 1875, but from this time onward the French had the center of the stage.

Their spread-eagle operations followed by a collapse in 1889, reorganization in 1894, and half-hearted efforts until 1898 served rather to make the world and the Americans think that a canal was a white elephant proposition. The Spanish-American War, however, suddenly brought the American people to a realization of the vital necessity, from a military viewpoint alone, of an interoceanic canal.

Day by day as the battleship *Oregon* steamed around Cape Horn this lesson was impressed upon the people. A 10,000-mile journey could have been saved by a Panama canal. The war over, and peace allowing the country and the government to consider other things, President McKinley reorganized the Isthmian Canal Commission which he had appointed in 1897 with the following personnel:

AMERICANS

ADMIRAL JOHN G. WALKER, *Chairman*,
SAMUEL PASCO,
GEORGE S. MORISON,
LIEUT.-COL. OSWALD H. ERNST, U. S. A.,
COL. P. C. HAINS, U. S. A.,
LEWIS M. HAUPT,
ALFRED NOBLE,
WILLIAM H. BURR,
PROF. EMORY R. JOHNSON.

This commission was appointed in March, 1899, with instructions to investigate all Central American routes. The French canal company by this time was in a situation where it was seeking a soft place to fall. Hope of financing the project by private capital absolutely was dead in France. Only by a sale to other capitalists or to some government, Colombia being willing, could the shareholders hope to get anything out of their stupendous investment. And it was not so many years distant before their concession would expire and their property revert to Colombia.

William Nelson Cromwell, a New York lawyer, was the counsel for the canal company and the Panama Railroad Company. He was, by all odds, the brainiest man connected with the French enterprise, and the task of guiding the company to a solution of its troubles devolved upon him. Naturally he was elated with the revival of interest in a canal on the part of the United States, and he was indefatigable, in many accomplished ways, in bringing the Panama

THE AMERICANS IN PANAMA

route to the notice of the Commission. P. Bunau-Varilla, a Frenchman, also was active in interesting Senator Mark Hanna, and other official and private Americans, in the French project.

The Walker Commission unofficially asked the French company what their property might be bought for, and when quoted a price of \$101,141,500, promptly decided that Nicaragua looked better. The report made on November 16, 1901, by the Commission frankly stated that the Panama route was preferable, but the price asked by the French company was prohibitive. The Commission dropped the remark that \$40,000,000 was about what the French holdings were worth to the United States.

The astute Mr. Cromwell probably was not greatly disturbed by this report, but the shareholders thought \$40,000,000 looked like a windfall to a bankrupt concern, even if it had invested \$265,000,000. A sixth loaf decidedly was better than none at all. They made it be known that \$40,000,000 would strike a trade. It has not been admitted, but the first valuation by Mr. Cromwell and associates doubtless was a "feeler" which would make the price ultimately agreed upon look like a bargain for the United States.

At any rate they fell off their perch in a hurry, and when they had agreed to the Commission's valuation, the report to the President promptly was revised in favor of the Panama route. Admiral Walker probably played his own little game in first recommending Nicaragua to send a chill down the French

AMERICANS

company's spine. On the outside one cannot tell how much theatrical play both sides indulged, but it is not a bad guess to believe that there was four-flushing all around.

CHAPTER VII

THE ROOSEVELT IMPETUS

THEODORE ROOSEVELT, upon assuming the office of President, promised to carry out the policies of President McKinley, and, so far as the canal policy is concerned, he succeeded so eminently that a deliberate judgment, formed from a perspective view of the whole undertaking, warrants the assertion that his energy, decision, and sound judgment made an interoceanic canal possible in this generation.

The moment his dynamic personality got behind the idea it received an impetus, and he bucked the line of obstacles that arose in the path of the project until he retired in 1909, when the enterprise was advanced beyond the possibility of failure.

It was to President Roosevelt that the Walker Commission reported in November, 1901. His first message to Congress urged immediate action, and, after a good deal of wrangling over the Hepburn act in favor of Nicaragua, the Spooner act was passed on June 28, 1902. The Nicaraguan route never has deserved the attention it received, for the natural drift of commerce and travel had gone unerringly for four centuries to Panama, like a flow seeking the course of least resistance. But the advocates of the Nicaraguan route created such opposition as to call forth from the President the exertion of the strongest

pressure to compel the selection of the Panama route.

The Spooner act, written by Senator John C. Spooner, of Wisconsin, provided for an Isthmian Canal Commission of seven members, and authorized the Panama route, if the French property could be bought for \$40,000,000, and a right of way could be obtained from Colombia. In the event such conditions could not be met, it authorized the Nicaraguan route, and seemed to lean toward a lock-type canal. An immediate appropriation of \$10,000,000 was made available for preliminary expenses.

President Roosevelt now had the authority he desired for going ahead with the project. Secretary of State John Hay and the Minister from Colombia, Jose V. Concha, immediately began corresponding over the granting of a strip of territory in Panama for the prosecution of the enterprise, with William Nelson Cromwell in the forefront of all the negotiations. The sale of the French property hinged upon securing the consent of Colombia.

A study of Mr. Cromwell and the important part he played throughout the whole career of the canal project leads to the conclusion that he did nothing more blameworthy than President Roosevelt did, while justice requires the admission that he gratuitously aided the government in a number of important particulars.

Minister Concha, with Mr. Cromwell's aid, drew up a treaty which was presented as a memorandum to Secretary Hay on April 18, 1902. This treaty, as

THE AMERICANS IN PANAMA

well as the Herran treaty that succeeded it, had a number of impossible provisions, viewed in the light of our canal experience. It authorized the French company to sell its property to the United States and authorized the United States to build, operate, and protect the canal, the concession to run for one hundred years, and be renewable at the discretion of the United States. A commission, jointly appointed by the United States and Colombia, was to govern the Canal Zone and supervise its sanitation, Colombia, however, remaining sovereign over the territory. One article bound the United States to a declaration that it had no ideas of territorial expansion in Central America; the United States was to build waterworks and sewers and pave streets in Panama and Colon; the United States guaranteed the sovereignty of Colombia and all its territory against all the world; Colombia retained the function of policing the Canal Zone, but in the event of its failure to do so, the United States could intervene until peace was restored, then withdraw. The canal was to be finished fourteen years after the adoption of the treaty with a possible extension of twelve years, everything to revert to Colombia if the canal was not begun within five years and completed within twenty-five years. Colombia renounced the \$250,000 annually paid by the Panama Railroad, but was to receive \$7,000,000 in cash. There were provisions granting the right to use any rivers and lands necessary for the canal, and admitting canal supplies free of duty, giving free

ROOSEVELT

passage to Colombian warships, and insuring the neutrality of the canal.

Colombia sent a new Minister, Thomas Herran, in 1903, who negotiated a treaty along the same lines, except that Colombia was to receive \$10,000,000 instead of \$7,000,000 for the Canal Zone. Had the treaty been adopted, it is a safe conclusion to draw that interminable and exasperating friction would have developed between the two countries, for even under our one-sided treaty with the Republic of Panama, in 1904, there was a quarrel over sovereignty and other questions. The provision giving Colombia the police affairs was impossible. Only an extended visit to the Isthmus can give an adequate idea of how essential it has been to the United States to have absolutely a free hand in the Canal Zone.

President Jose M. Marroquin, of Colombia, in this year, 1902, asked the United States to maintain uninterrupted passage over the Panama Railroad, during a serious revolution in the province, and promised in return to give the United States a treaty for a Canal Zone. As a result of American intervention and good offices, peace was patched up between the insurgents and Colombia on November 21, 1902. We had performed our part of the agreement, and now looked to Colombia to perform its part.

President Marroquin was in good faith, but factional fighting in the Congress of Colombia, with his enemies in the ascendancy, showed the chances of a treaty to be dubious. The American Minister delivered a warning to the government of Colombia, on

THE AMERICANS IN PANAMA

June 13, 1903, that it would be expected to live up to its solemn promise of 1902. The influences behind the opposition to the treaty in the Colombian Senate have not been definitely classified, but it is more than a supposition that certain American financial interests, which opposed any canal, took a hand to the extent of intimating that a country so "rotten rich" as the United States could pay more than \$10,000,000 for a Canal Zone.

But there is another factor that is more illuminating. The concession of the French company would expire in 1910,* and by waiting seven years Colombia could get the \$40,000,000 the United States was willing to pay for its property. There was one bar to this in the concession of the Panama Railroad which had many years to run, and which gave the railroad the right to decide whether a canal could be built across the Isthmus. Still, indisputably, the position of Colombia would have been strengthened immeasurably by the lapsing of the French canal concession, and the people of the United States have only to ask themselves what they would do if they had a property which in seven years would be worth \$40,000,000 more than it was to-day. There is not a doubt that popular sentiment would say, as one faction said in Colombia, wait for the enhancement before selling.

On August 12, 1903, the Senate of Colombia killed the treaty after the House had passed it. President

* Acknowledgment for this and other facts is made to the *Canal Zone Pilot*, edited by W. C. Haskins.

ROOSEVELT

Marroquin had exerted himself to the utmost to save the treaty, doubtless sensing the quality of the man in the White House, but to no avail, and another way out for the canal project was already taking form.

CHAPTER VIII

TAKING THE CANAL ZONE

ANYONE who expected Theodore Roosevelt to wait patiently and untie the Gordian knot of diplomacy that held the canal project in abeyance simply did not know the temperament of the Chief Executive.

His inherited administration was more than half gone. If he desired to make a real showing before the opening of the battle for the Presidency in 1904, decisive action was necessary. The course of Colombia indicated clearly to him, and to the people of Panama, that nothing could be expected in the immediate future in the way of a satisfactory treaty, and the enemies of the canal in that country seemed to be firmly intrenched in the Congress.

Just when the idea of a revolution as a means of obtaining what diplomacy had failed to obtain, originated, and who originated it, are not matters of clear record, but, in the spring of 1903, threats freely were made in Panama that if Colombia did not grant a treaty to the United States, providing for a canal, the province of Panama would consider that its interests had not been conserved by Colombia, and might proceed to act for itself.

Panama's relations with the parent government at Bogota, from 1821, the year of independence from

REVOLUTION

Spain, to 1903, the year of independence from Colombia, had been characterized by intermittent revolutions which never had attained a decisive and final result.

There had been fifty-three revolutions in fifty-seven years, the most sanguinary occurring in the years 1827, 1840, 1860, 1900, and 1902. But any advantages so gained by Panama had been lost by voluntary or involuntary resumption of subordinate relations to Colombia, with the net result going to prove that Panama, unassisted, never could hope to achieve independence from the mother country.

The United States, on many occasions, had intervened in these quarrels between Panama and Colombia, frequently on the invitation of Colombia, and always to maintain the neutrality of the Panama Railroad, as well as to preserve general American property interests. An American warship was a familiar sight in Colon or Panama harbors.

These interventions were based on our treaty with Colombia, ratified in 1846. As noted before, this treaty provided for the joint sovereignty of Colombia and the United States over any canal that might be built in Panama, and further guaranteed the neutrality of the Panama Railroad. By this treaty, and the Clayton-Bulwer treaty with England, over any canal that might be built in Nicaragua, the United States hoped to keep foreign governments out of Central America so far as an interoceanic canal was concerned.

Colombia, in 1902, appealed to the United States

THE AMERICANS IN PANAMA

under its treaty, to maintain the neutrality of the Panama Railroad, during the most important revolution that Panama ever had attempted, and the military intervention by the United States in that year largely enabled Colombia to crush the revolution.

It is important to note that, prior to 1903, the United States had maintained the attitude consistently that any action it took in Panama was in fulfillment of this treaty of 1846, and leaned toward the government of Colombia as a sovereign power engaged in suppressing the fitful insurrections on the part of Panama.

By maintaining the neutrality of the railroad, through the use of Marines, the United States kept the line open, and so enabled Colombia to get its troops across the Isthmus to strike down the revolutionists. Had not the United States thus assisted Colombia, it is doubtful if she could have retained sovereignty over Panama without the exertion of considerably stronger forces than were employed.

Colombia had promised, in consideration of the intervention of 1902, a treaty to the United States for a right of way for a canal in Panama. Weeks before this treaty was killed, on August 12, 1903, a few leading business and professional men in Panama saw the drift, and so did the French Panama Canal Company and the Panama Railroad Company. The Panamans wanted the prosperity that would come from the money the United States would invest in Panama, and the two companies wanted to sell out before their concessions should expire, and at a price, \$40,000,000,

REVOLUTION

which the United States had agreed upon, and which was the highest offer they had any hope of receiving.

Simultaneously with the killing of the treaty by the Colombian Senate, a revolutionary Junta of wealthy Panamans and resident Americans were in New York and Washington broaching their plan of a revolution and separation from Colombia as a way for the United States to get a Canal Zone. They authorized one of their number, Mr. J. Gabriel Duque, owner of the Panama Lottery, and a daily newspaper, to visit Secretary of State John Hay to ascertain the part the United States would play in the scheme.

The plan proposed was that Panama should proclaim its independence from Colombia on a given date, to be followed by the recognition of its independence by the United States, and the signing of a treaty with the new republic which would give our government the desired right of way for a canal. Then the United States could buy the French canal interests and the Panama Railroad according to the Spooner act.

Mr. Duque was convinced by his conference with Secretary Hay that the United States was in a mood to try any plan that promised an early solution of the problem of securing a Canal Zone. Secretary Hay, of course, committed nothing to paper, and talked in a negative rather than a positive manner about the part the United States would play in a revolution, but he did suggest that September 22d, the date originally set for the revolution, was perhaps a trifle premature; that they might do better to wait a few weeks. September 22d was the day the Congress of Colombia

THE AMERICANS IN PANAMA

had intended to adjourn, and therefore the last day that this body might reverse its action and ratify the treaty. The Colombian Congress actually did not adjourn until October 30th, and the date of the revolution was accordingly advanced to November 4, 1903.

The Junta went back to Panama to make their preparations. Minister Herran, representing Colombia at Washington, immediately notified his government of this conference, and its import, and urged that the garrison at Panama be strengthened. President Marroquin, of Colombia, did not follow this advice, doubtless hoping for a change of sentiment in his country that would ratify the treaty. He instead showed his friendliness to Panama by appointing as its Governor, Don Domingo de Obaldia, a known friend of the treaty and of the province. This and other actions by President Marroquin seemed to create favorable conditions for the success of the revolution.

About four hundred Colombian soldiers, under Gen. Huertas, constituted the garrison of Panama. This commander was won over to the cause of the revolutionary Junta, thus giving them a clear field for their prospective operations, provided Colombia did not send fresh troops. Colombia could send reënforcements, either from Cartagena, on the Atlantic side, or from Buenaventura, on the Pacific side. But September and nearly all of October passed without any such action.

In the latter part of October, two gunboats of Colombia, in the harbor of Panama, on the Pacific side, asked the Panama Railroad to supply them with

REVOLUTION

coal so that they might go to Buenaventura for troops to add to the Panama garrison. J. R. Shaler, superintendent of the railroad, was acting with the Junta as the representative of the French interests in the revolutionary scheme. At the Junta's suggestion, he refused to supply the coal, although the railroad had followed such a practice from time immemorial. He evaded the request by saying that the coal was in Colon, on the Atlantic side. This action, therefore, headed off the arrival of troops from the Pacific port of Colombia.

All that remained to be done, to create perfect conditions for carrying out the secession, was to prevent the arrival of Colombian troops from the Atlantic side. This, it may be acknowledged, was the most vital task of the whole plan, and it devolved upon the United States. The understanding the Junta had with our State Department was that the United States would maintain the neutrality of the Panama Railroad, construing neutrality, in this instance, to mean that Colombian troops could not pass over the line.

Such a construction of the treaty of 1846 was unprecedented before 1903. The United States had undertaken, in effect, to prevent the passage of Colombian troops over a railroad which it had chartered and the concession of which expressly provided for the passage of Colombia's troops over the line at any time. It justified this unusual action on the argument that it was thereby maintaining the neutrality of the railroad as provided by the treaty.

Our State Department was kept advised of the

THE AMERICANS IN PANAMA

movement of Colombian troops, so that when two ships left Cartagena, on October 30th, for Colon, the gunboat *Nashville* simultaneously received orders to proceed to Colon, arriving there on November 2d. The Colombian troops, numbering about five hundred men, arrived on November 3d. Everyone recognized that the crucial moment of the revolutionary scheme had arrived..

Commander John Hubbard, of the *Nashville*, had orders to keep the Panama Railroad open, not allowing either Colombian or revolutionary troops to be transported over it. This was termed maintaining the neutrality of the railroad. It should be noted, however, that when this order was issued to the *Nashville*, no revolution had started, and, outside of a few Panaman capitalists, the people of Panama knew nothing about it except in the way of rumor. The Junta had appointed a committee to "let the people know of the impending event," but as the people were not necessary to the success of the plan, so long as the United States did its part, they were not specially considered or consulted by the Junta. Hence, the order to prevent the passage of revolutionary troops not only was premature, showing the thorough knowledge the United States had of the revolutionary plan, but it was likewise superfluous. Still, we hardly could have kept a straight face over the order if the nonexistent revolutionists had not been included.

Generals Tovar and Amaya, of the Colombian troops, left them in Colon while they went across ahead to take command of the Panama garrison. The ar-

REVOLUTION

rival of the reënforcements was a day earlier than the date set for the revolution, which was November 4th, so the Junta had to advance its plans a day. It hastily was decided to pull off the event on November 3d.

As a first step in this decision, the two generals were arrested, as also was Governor Obaldia. The Panama garrison under Gen. Huertas had been fixed weeks before, so no danger lay in that quarter. An ordinary street mob of a city followed the lead of the Junta in these actions. One of the Colombian gunboats in the harbor of Panama fired two shots over the city, one of which by chance struck a nonbelligerent Chinaman, who had the honor of being the only victim of the revolution. The land fort replied and the gunboat precipitately retired, leaving Panama in the hands of the triumphant Junta. All was lovely if the United States should perform its part at Colon.

The news of these proceedings in Panama did not reach Colon until the next morning, November 4th. Col. Torres, who had been left in command of the Colombian troops there, immediately demanded a train by 2 o'clock that afternoon, a refusal to grant which, he declared, would be followed by the death of every American in the city. Mr. Shaler, the railroad superintendent, following the instructions of the Junta, and the wishes of our State Department and the French interests, refused the transportation, and notified Commander Hubbard, of the *Nashville*, of his decision.

There only were 192 men all told on the *Nashville*, while the Colombian troops numbered 500, not count-

THE AMERICANS IN PANAMA

ing the assistance they would get from the native population, if the day seemed to be going against the Americans. The employees of the railroad, with 42 men from the *Nashville*, fortified themselves in a stone railroad shed, while the women and children were placed on steamers in the harbor for safety. The *Nashville* drew up close to assist with its guns in the defense.

It was a tense situation where the slightest overt act on either side would have precipitated a great loss of life. The Colombians outnumbered the marines ten to one, but when 2 o'clock came, they had thought better of their threat, and asked for a parley. It was agreed that both sides should withdraw from Colon while the Colombians sent an officer to Panama for a conference with the imprisoned generals. A special train was provided for the emissary.

The next day, on November 5th, the *Dixie* arrived with 400 additional marines. It became apparent to the Colombians that the full power of the United States was back of the railroad company's refusal to transport them to Panama, and so they agreed to take ship again for Colombia. On the 6th, the day following their departure, the *Atlanta* arrived, bringing the number of marines up to 1,000. The Navy Department also sent ships to the city of Panama on the Pacific side, but there was nothing for them to do there.

Fresh orders from Washington to the marines were to the effect that Colombia would not be allowed to settle the "revolution" by force. That lone Chinaman had been buried, so that it would have taken a microscope to find the revolution. But the orders

REVOLUTION

plainly enough showed where the United States stood in regard to the secessionary movement, and since by force was the only way Colombia could settle the revolution, the orders in substance meant that it was the United States, and not Panama, that Colombia would have to fight to regain sovereignty over her richest province.

The Colombian troops on November 4th might have wiped out the American defense in Colon, swept over to Panama and crushed the Junta and street mob there, and so summarily preserved sovereignty over the territory. And had it done all this, it would have been squarely within its rights as a sovereign nation. But they knew that such a triumph would be transient. They realized it would bring down upon Colombia the whole devastating force of the mighty United States, which the Spanish-American War so recently had shown was something truly to be feared. Hence, their withdrawal was prudent, though humiliating. It is superfluous, of course, to remark that the United States could not have played such a rôle with any nation capable of defending itself.

Commander Hubbard had no illusions about the vital part the United States played in making the revolution a success. He stated, in the following paragraph of his cablegram to the Navy Department on November 5th, that the critical time was when the marines stood between the Colombian troops and passage to the seat of insurrection at Panama. Said he:

“I am positive that the determined attitude of our men, their coolness and evident intention of standing

THE AMERICANS IN PANAMA

their ground, had a most salutary and decisive effect on the immediate situation and was the initial step in the ultimate abandoning of Colon by these troops and their return to Cartagena the following day."

On November 6th, two days after the "revolution," the United States recognized the independence of the Republic of Panama. This was two days before the news of the secession reached Bogota, the capital of Colombia. There was a popular demonstration against the United States in that city, but no attempts against American life or property. The faction which had favored the treaty recognized that the United States had grown tired of diplomatic dilly-dallying. The faction antagonistic to the treaty realized that the United States had stolen second base in the canal game. The Colombian government offered an immediate treaty if the United States would permit it to recover Panama, but President Roosevelt spurned the overtures.

Within twelve days after recognizing the independence of the new republic, the United States had secured a treaty which ceded to it a Canal Zone. P. Bunau-Varilla, of the French Canal Company, was made the Minister of the de facto Panama government, to negotiate this treaty with Secretary Hay. Thus the United States was assured of getting all that it had been promised by the Junta. The first article of the treaty signed on November 18th, at Washington, stated that "The United States guarantees and *will maintain* the independence of the Republic of Panama." Colombia thereby was notified that Panama, the his-

REVOLUTION

toric transit route of the new world, was lost to her sovereignty.

Extreme haste in signing the treaty before there was a regular legislative body at Panama had been necessary because President Roosevelt wished to get the whole affair safely accomplished before our Congress should open on December 7th. The Republic of Panama ratified the treaty on December 2d, but the American Senate, miffed a little that the Executive should take such important—and to many questionable—action without its knowledge or consent, debated for several months, then finally ratified the treaty on February 23, 1904. The American people have in this whole transaction an illuminating example of the power a President has to commit the United States to a radical policy during a recess of Congress.

President Roosevelt always had leaned strongly toward the Panama route for a canal. The setting up of a republic there had the effect of complying with the Spooner act, which made the selection of the Panama route depend upon securing a right of way at this point. He made the point to Congress in his message on December 7th, that as the new treaty provided this right of way, it became imperative that Panama be chosen, and thus the revolution was used as a club to force the selection of Panama over Nicaragua.

The advocates of the Nicaragua route already had been urging that as Colombia refused a right of way at Panama, the United States was compelled to turn to Nicaragua. President Roosevelt did not believe Nica-

THE AMERICANS IN PANAMA

ragua was the proper place for a canal, and his judgment on this point, in the light of later years as well as from all logical considerations of trade and topography, was eminently sound. His consent for the United States to go the length it did in securing the Panama route was prompted by his desire to prevent the nation from selecting a less advantageous route.

It has been charged that the President favored Panama so that the American financiers, led by Mr. Cromwell, who were interested in selling the French property to the government, could get the \$40,000,000 the sale involved. This charge is not justified either by the character of President Roosevelt or by the natural advantages of the two routes. It is doubtful if the President gave any thought to the owners of the French interests, and it is certain that such ownership was not a factor in determining him in favor of Panama.

The French interests, of course, had staked all on the success of the revolution. Had it failed, Colombia would have forfeited their concessions forthwith, and Minister Herran had notified them to that effect. It is clear that Mr. Cromwell and associates were dead certain that the United States never intended that the revolution should fail. Their grasp on the situation is shown by the naming of M. Bunau-Varilla to negotiate the treaty with the United States for Panama.

With \$40,000,000 hanging in the balance, the French interests were prepared to be generous in drawing a treaty. It is to be doubted if a more one-sided treaty ever was drawn. Secretary Hay,

REVOLUTION

with the willing consent of the Junta, gave the United States all the latitude we would have had, if, instead of taking a Canal Zone, we had taken the whole republic. Panama got all that had been promised to Colombia, including a cash payment of \$10,000,000, and beginning in 1913, an annual payment of \$250,000. The United States is to pay for any additional lands in the republic that may be needed for the canal and we may use any rivers or lakes in the republic necessary to the canal, two provisions broad enough to permit the conversion of the whole republic to the position of an adjunct to the canal. The cities of Colon and Panama were made subject to American sanitary measures, and if Panama cannot preserve order, the United States, in its discretion, may introduce troops for that purpose, a right which substantially robs the republic of sovereignty. The United States guarantees the neutrality of the canal but reserved the right to fortify it.

Nobody in the Canal Zone makes any pretense that the United States was disinterested in its part in the revolution. Most of the canal employees wonder why the President did not take the whole republic. Many confidently expect the United States to abolish the government there sooner or later, because it is clear that the republic cannot stand clear of American support. On three occasions already the Americans have prevented the disruption of the republic. In 1904, Gen. Huertas, who had assisted the Junta, became dissatisfied with his rewards, and started to overturn the administration by force. The marines had to dis-

THE AMERICANS IN PANAMA

arm his small army. In 1908 the United States had to interfere to insure a fair election, and in 1912 this writer saw the presidential campaign reach a point where the marines and infantry had to be placed at the Panama polls to prevent rioting and fraud. It was obvious that if the United States had not been present in armed force the usual Central American method of changing administrations by a revolution would have been employed. How long will the United States be patient with such conditions?

President Roosevelt did not appear in the revolution preliminaries because his part later on required the "Oh, this is so sudden" tone, in recognizing the independence of the new republic. He devoted himself assiduously to proving that the United States had done a righteous thing in that act and had closed his message with the high profession of friendly zeal to the effect that "he would not for one moment discuss the possibility of the United States committing an act of such baseness as to abandon the new Republic of Panama." But eight years later, in San Francisco, he threw off the mask thus assumed and declared: "I took Panama and left Congress to debate the matter afterward."

Did President Roosevelt know that his government deliberately aided and abetted a province of a sovereign power, with which the United States had a solemn treaty, to secede and set up an independent government, so that the United States might get territory it otherwise could not obtain?

REVOLUTION

Dear reader, you might just as sanely ask a Panaman if he thinks it will be wet in the next rainy season!

Was there anything, big or little, going on in Theodore Roosevelt's administration with which he was not fairly familiar? Secretary Hay had given the impression to the revolutionary Junta that if they would go through the trifling act of raising a flag, the United States would do the rest. When Secretaries of State begin assisting revolutions in foreign countries without the knowledge and consent of the President, it will be under a far less dominating Executive than Theodore Roosevelt!

With the ratification of the treaty, the decks at last were cleared for the long-dreamed-of project of building a canal. The people of the United States frankly were glad that such progress had been made, but they were inclined to believe that it would not be well to nose too deep into the method of acquiring the territory. They knew that the payment of \$10,000,000 for the Canal Zone paid somebody for the right of way, though whether the rightful owner was a question the administration was very glad to let remain dormant. The *Saturday Evening Post*, speaking editorially in the spring of 1912, doubtless expressed the attitude of many Americans when it said:

“It seems to be the part of statesmanship in this dilemma to talk loudly about the benefits we confer upon the world's commerce by digging the canal and to regard our acquisition of the canal a closed incident.”

THE AMERICANS IN PANAMA

Yet, the American people never have solved any issue in which a moral question was involved, by thus seeking to obscure it. The true facts about the acquisition of the Canal Zone only came out by dribs, but events seem to conspire to bring the whole transaction to light. On June 26, 1912, Mr. J. Gabriel Duque, who had been a leader in the revolution, got into a controversy with Mr. Ricardo Arias, also a member of the 1903 Junta, and over his own signature in his paper, *The Star and Herald*, published at Panama, made the following admission:

“Mr. Arias should know that I have friends in Washington, seeing that as far back as 1903 when we worked together for Panama’s independence, I was in confidential treatment with Secretary Hay.”

Mr. Tracy Robinson, author of a book on Panama, was another leading figure in the revolution. He declines to give the history of the affair, although so competent to reveal its inward processes, but tells his readers that “The details would afford material for a wonder story.”

Since President Roosevelt has candidly confessed that he “took” Panama, there is no reason why the main actors in the play should not speak out and the immediate future is going to see the disclosure of much illuminating material about this “wonder story.” The American people have had a vague idea of what did happen at Panama, but there is no longer any excuse for a pretense of virtuous conduct on the part of

REVOLUTION

the United States, except on the point of giving the world something essential to its convenience. It is hypocritical to profess that we made adequate compensation when we paid Panama for the Canal Zone. We must applaud President Roosevelt for taking the Canal Zone, but the failure to make reparation to Colombia is a conspicuous piece of self-deception and moral obliquity. We raised the *Maine*, however, and we will yet make amends to Colombia.

CHAPTER IX

THE GEOGRAPHY OF PANAMA

NATURE quietly, but imperatively, asked the engineers who favored a sea-level canal at Panama: Why will you insist upon the prodigious disarrangement of natural advantages that lie here awaiting the utilization of a lock type?

The geography of the Isthmus is adapted peculiarly to the lock type of canal. Aside from the obstacle to a sea-level canal that existed in the continental divide, the Chagres River followed a course which, at the same time, would have been a baffling problem in a sea-level plan, but the most beneficent arrangement for a lock-type canal.

The territory comprised in the scope of this book is the same as that within the boundaries of the Republic of Panama. In area, it is about 32,000 square miles, slightly smaller than the State of Indiana. On the Atlantic side it is 379 miles long, and on the Pacific side, 674 miles by the coast line. The population, native and foreign, is around 400,000 to-day, though considerably less in the days of exploration and conquest.

Our treaty with the Republic of Panama ceded us a strip of territory ten miles wide, from deep water in the Atlantic to deep water in the Pacific. This territory, officially designated the Canal Zone, is de-

GEOGRAPHY

terminated by a line drawn five miles from each side of the center line of the route of the canal. Thus, the Canal Zone is not bounded by straight lines from ocean to ocean, but curves as the channel of the canal curves. The area of the Canal Zone is 448 square miles, of which 73 square miles are privately owned, but may be bought in the discretion of the United States. While within the limits of the Canal Zone, the cities of Panama and Colon, at the terminals, remain under the sovereignty of the Republic of Panama.

Some confusion is caused by the fact that the Isthmus of Panama runs nearly East and West, instead of North and South, as might be imagined, at the point where the canal traverses it. Panama city is almost due south of Buffalo, and is southeast of Colon, the Atlantic terminal. The canal route, therefore, runs in a southeastern direction from the Atlantic to the Pacific, and, to the astonishment of the tourist, the sun rises in the Pacific and sets in the Atlantic.

We are not building our canal at the narrowest point on the Isthmus. This point is found at the Gulf of San Blas, 60 miles east of Colon, where the Isthmus is only 30 miles wide, whereas, at Panama, it is 47 miles wide. Because the mountain barrier at San Blas has an elevation of 700 feet above sea-level, no serious thought of a canal there ever was entertained long. The absence of rivers makes the sea-level type the only kind of canal that could have been attempted at San Blas, involving a staggering task of excavation. Besides, it was in the complete grasp

THE AMERICANS IN PANAMA

of the jungle, while at Panama there was a beaten path, from ocean to ocean, four centuries old.

The Chagres River (pronounced Shag-gress) originates in the San Blas Mountains, and drains a basin of 1,320 square miles. After running parallel with the coast line, nearly midway between the oceans, it turns sharply at right angles and empties into the Caribbean Sea, a few miles west of Colon. The point where the Chagres makes this turn is within the Canal Zone, and about 30 miles from the Caribbean, running through the Canal Zone for that distance. From the Caribbean Sea to Bohio, about seventeen miles, the bed of the river is only slightly above sea-level, and from Bohio to about the entrance of the Culebra cut, it rises to 48 feet above sea-level.

Engineers were divided on the utility of this natural geographical situation. Those who favored the lock-type canal believed that the Chagres River could be dammed up so as to form the longest part of the canal, and thus save a vast amount of excavation that would be required in a sea-level type. While not denying the saving in excavation in a lock type, the engineers who favored a sea-level canal believed that the fixed limitations of the lock type made it inadvisable, when the expansion in the size of ships was considered. Their plan was to divert the Chagres and tributary rivers, of which there are 26 in the Canal Zone, by digging new channels for them, and so get them out of the way of the canal.

The French, in 1880, had started out on that theory. They thought of digging a great tunnel through

GEOGRAPHY

the mountains to divert the Chagres River into the Pacific Ocean. This tunnel would have been 10 miles long and, needless to say, a rather visionary undertaking. Five years after they began operations they abandoned the sea-level plan and adopted the lock-type canal. But their dam across the Chagres River was to be at Bohio, seventeen miles inland from the Caribbean, while the American engineers advised a dam at Gatun, only seven miles inland.

At Gatun, the natural formation of the mountains permitted the Chagres River to escape into the Caribbean Sea through a gap less than two miles wide. The lock-type advocates said this gap could be filled in and so create a basin to be filled by the stagnated water of the Chagres River. The idea was to build a dam high enough to back the accumulated river water toward the Pacific for a distance of 32 miles, and at an average depth, in the canal channel, of 45 feet throughout. Another dam would prevent the lake so formed from spilling down the Pacific slope. Thus, all but 15 miles of the canal would be made by an inland, artificial lake, 164 square miles in extent.

But even in a lock type there would have to be an impressive amount of excavation. Not only would the sea-level channels approaching this lake on either side of the Isthmus have to be dredged, but the mountain barrier, running lengthwise with the Isthmus, would have to be pierced with a channel so as to permit the waters of the Gatun lake to reach the point on the Pacific side where the locks would afford the descent to the ocean. As the surface of the lake was

THE AMERICANS IN PANAMA

proposed to be 85 feet above sea-level, the bottom of the channel through the mountains would have to be 45 feet lower than the surface elevation, or at 40 feet above sea-level.

The area to be excavated in this lake channel, 32 miles long, was from Gatun to Obispo, following the Chagres River in general, and requiring only about 12,000,000 cubic yards to be removed, in 23 miles. Then the mountains began, 45 feet above sea-level, and reached their highest point, in the center line of the canal, at Gold Hill, 312 feet above sea-level, thence sloping toward the Pacific, to the proposed lock site at Pedro Miguel, a distance of 9 miles. The average depth of the cut would be 120 feet throughout the 9 miles, and the deepest point of excavation at Gold Hill would require going down 272 feet.

The Culebra cut, as this channel through the mountains was called, was to be 200 feet wide. In 1880, the French had begun work there, and they removed 18,646,000 cubic yards that were useful to the Americans. Their machinery was used the first year of our occupation.

At Gatun, on the Atlantic side of the proposed lake, there would be locks to lift ships to the lake, and at Pedro Miguel and La Boca, on the Pacific side the locks would lower the ships to sea-level again. The Cocoli and other rivers could be used to form a second small lake between the Pedro Miguel and La Boca locks. The total excavation for the sea-level channels and the Culebra cut was estimated around 100,000,000 cubic yards.

GEOGRAPHY

Opposed to these considerations in favor of a lock type were the arguments advanced in behalf of a sea-level canal. The popular mind could see ships steaming or sailing uninterruptedly from ocean to ocean through a dugout channel that would not grow too small for the largest ships that time might develop, and the engineers who advised such a canal asserted that the difference in time and cost of building the two types was not materially in favor of the lock type. Time has developed that such a belief was widely erroneous.

The Americans came to the Canal Zone in 1904 with the question of the kind of canal to be built unsettled. They were to be there more than two years before the violently discussed issue was to be settled. It was like starting in to build a house without any definite plan in mind. Meanwhile, however, it was recognized that there was a vast amount of pioneer and preparatory work to be accomplished that would absorb the activities of the organization pending the solution of this problem.

What kind of a country, as to temperature, rainfall, vegetable and animal life, and healthfulness, had we secured? As to the first characteristic, Panama is only 9 degrees from the Equator. But it is far from being as hot as that proximity might suggest. Throughout the year the temperature averages about 85 degrees. The highest recorded temperature in the Canal Zone is only 97 degrees. At night the atmosphere falls sharply until, usually, light covering is required on beds, and the hot, sweltering nights of

THE AMERICANS IN PANAMA

American cities in the summer are unknown. Palm Beach, Florida, in the winter, is not a more desirable resort than Panama.

The northern mind, too, considerably has overestimated the effects of the rainy season at Panama. During January, February, March, and April there is practically no rainfall. By the 1st of May light showers occur daily, or every few days, and through June, with an occasional gusher. From then, on to December, the rains become more frequent and heavier, and have a way of coming up about the same time every day, sometimes in the afternoons, sometimes in the mornings. Between showers the sun is radiant. Construction operations have to be suspended during the violent downpours, and the canal employees call any rain that occurs in the noon hours, or after work, "a government rain."

On the Atlantic side the rainfall averages between 130 and 140 inches annually; on the Pacific side from 60 to 70 inches. At times it rains so furiously that it appears to be one continuous sheet of water falling. For one hour the record fall is 5.86 inches; for one day, at Porto Bello, 10.06 inches; in three minutes 2.46 inches fell at the same place; and at Panama on May 12, 1912, 6 inches fell in two hours. The years 1906 and 1909 were the wettest since the American occupation and 1912 the dryest.

This heavy precipitation makes the rivers of Panama torrential streams. The Chagres River has risen 25 feet in twenty-four hours. During every rainy season the records left by the French and kept by the

GEOGRAPHY

Americans since their occupation show that this river discharges enough water to fill the proposed Gatun Lake one and a half times. It is not expected that any lack of water for the lock-type canal ever will be experienced.

Except for the beaten paths and cleared spaces constantly maintained the jungle is king in Panama. One season's growth will cover an abandoned clearing with the luxuriant tropical vegetation. When the Americans entered the Canal Zone, most of the French machinery and even whole towns were covered by the jungle.

There are the usual tropical fruits, bananas, coconuts, alligator pears, papayas, mangoes, and other less well-known varieties. The vegetation includes the royal poinciana, palm, and other stately trees. The rare orchid is at home on the Isthmus, about seventy-five varieties being found, a dozen of which are of the most beautiful kinds. A dry season of four months does not parch the growth, but the rainy season gives it the most brilliant green coloring.

None of the big animal life of Africa is found anywhere in South America, and Panama has even less dangerous species than the mainland. The tarantula, coral snake, tiger cats, deer, and other larger, though not so dangerous, animals are found, and alligators abound in the rivers and bays, as well as sharks. The insect life is wonderfully varied, the birds are in infinite variety and most beautiful, while wild flowers of dazzling colors are in profusion. The Canal Zone,

THE AMERICANS IN PANAMA

where occupied in the canal operations, long since was freed of dangerous animal life.

Distinct, but inconsequential, earthquake shocks have been felt in Panama for centuries. The San Francisco earthquake, in 1906, was not recorded on the Canal Zone seismograph. In the seventeenth century a violent shock occurred, but none in the eighteenth and nineteenth centuries, nor has any been recorded in the twentieth century, although in Costa Rica, the republic adjoining Panama, a severe shock, in 1910, caused considerable loss of life and property. So far as past performance can indicate, the canal should not suffer from earthquakes.

The Atlantic and Pacific oceans are on the same level, but the tide on the Pacific side has a maximum lift of 21 feet, while on the Atlantic side the maximum lift is only $2\frac{1}{2}$ feet. Allowance for this variation was made by providing a deeper channel for the canal on the Pacific side, so that the passage of ships will not be affected by the tides. The shape of the Bay of Panama causes the high tide on the Pacific side.

As there is not a favorable geographical arrangement at either end of the canal, in the way of harbors, the defects have been supplied by breakwaters. At the Atlantic entrance a breakwater more than two miles long runs from Toro Point to shield ships lying in the entrance from the violent Northers that occasionally sweep the coast. Another breakwater a half mile long, running out from the Colon waterfront, will protect shipping in that harbor from storms on

GEOGRAPHY

the east. At the Pacific entrance storms are not dangerous, but the currents deposited silt in the channel in such quantities as to make a breakwater advisable, and this one runs from the mainland to Naos Island, three miles out in the bay, and connects with the fortifications. It was built from material excavated in the Culebra cut, whereas the Atlantic breakwaters were built largely of rock quarried at Porto Bello.

Panama and Colon are cities of great interest to the tourist. The former has about 50,000 population and the latter 20,000. Panama is the capital of the republic, has a handsome national theater and institute, a street car system is in course of construction, and a number of old cathedrals are interesting sights. The canal employees travel for half fare on the railroad and are often in evidence in the quaint little victoria carriages that handle the street traffic, at ten cents a ride, in the two cities.

Mardi Gras comes in February in the city of Panama, and is a vivid exhibition of the Spanish temperament at play. For four days the natives abandon themselves to the festivities and business reaches a standstill. A queen is elected by popular vote and receives the homage of all the Panaman officials, as well as the higher American dignitaries. The parade of floats and carriages is a dazzling presentation of the Spanish fancy expressed in dress and decorations.

CHAPTER X

GETTING UNDER WAY

“**W**HAT this nation will insist upon is that results be achieved,” wrote President Roosevelt in his order creating the first Isthmian Canal Commission that he appointed, on March 8, 1904; and that remained the keynote of his attitude toward the canal. The country was thoroughly convinced of the inefficiency of any government-built enterprise, so, after complying with the Spooner act in naming a representative from the navy and the army, on the Commission, he announced its full personnel as follows:

ADMIRAL JOHN G. WALKER, U. S. N., *Chairman*,
MAJ.-GEN. GEORGE W. DAVIS, U. S. A.,
WILLIAM BARCLAY PARSONS,
WILLIAM H. BURR,
BENJAMIN M. HARROD,
CARL EWALD GRUNSKY,
FRANK J. HECKER.

This Commission held its first meeting in Washington on March 22d, when preparations were made for a visit to the Isthmus, which they reached on April 5th. After three weeks of investigations they decided that such engineering records as the French left must be supplemented by fresh explorations and surveys;

UNDER WAY

that the sanitation of the Canal Zone, and the cities of Colon and Panama, was of the first importance; and that a period of preparation generally must precede effective construction operations. Surgeon-Col. W. C. Gorgas accompanied the Commission on this trip and made the preliminary plans for cleaning up the Isthmus which, when worked out, were to make him famous. The Commission returned to the United States on April 29th.

At a meeting between representatives of the United States and the French Canal Company, in Paris, on April 16th, the sale of the company's property, for \$40,000,000 was signed, and was ratified by the shareholders in the company on April 23d. This ended the labors of Mr. William Nelson Cromwell, except that he tried, unsuccessfully, to get an additional payment for the work done on the canal, from the time the \$40,000,000 was agreed upon as a price, in 1902, until the Americans formally took over the property, in 1904.

President Roosevelt was subjected to wide criticism for this deal, but of all his actions in connection with the canal it was one of the wisest. Without regard to who got the money it indisputably is true, to anyone who has visited the canal, that the United States got a dollar in value for every dollar it paid the French company. As late as 1911 Col. Goethals appointed a committee headed by J. B. Bishop, secretary of the Commission, to invoice the French purchase, and they reported the value of French excavation useful to the American plan of canal, the mechanical

THE AMERICANS IN PANAMA

equipment, buildings, and engineering records, to be \$42,799,826, or nearly \$3,000,000 more than was paid. At the same time it was a good sale for the French company because the United States was the only prospective buyer.

The item of largest value to the United States, as estimated in the report, was the excavation of 29,908,000 cubic yards, valued at \$25,389,240. This mainly was in the Culebra cut. Next in importance was the Panama Railroad and subsidiary trackage in the Canal Zone, and the remainder was for quarters, hospitals, storehouses, machine shops, canal equipment, itemized in part as follows:

Three 2,000-ton steamers of the Panama Railroad Steamship Line; 30,000 acres of land comprising practically all the real estate in the city of Colon and a valuable part of the city of Panama; 625,000 acres of land with the canal concession; 2,265 buildings of all descriptions; 212 Belgian locomotives; 34 American locomotives; barges, yawls, launches, dredges, cranes, drills, dump cars, and vast quantities of steel rails, machinery parts, pumps, steam winches, and other equipment in profusion.

Much of the mechanical equipment and whole villages of houses used by the French employees were covered with a dense growth of jungle after years of idleness, but the machinery had been oiled and painted carefully before abandonment, and so was preserved in good condition when the Americans came. Had not the French buildings been available and capable of being speedily repaired for use, the early Ameri-

UNDER WAY

can employees would have suffered more hardships than they did. Of these buildings, the Americans repaired and used 1,536, their value being estimated at \$1,879,203.80.

Construction work was carried on the first year of American occupation largely with old French equipment. The closing days of the canal find a considerable amount of it still in use. A great deal of light work by locomotives was done by the Belgian engines that the heavy American types could not handle economically. That part of the equipment which could not be utilized was used as ballast on the Panama Steamship liners to the extent of 27,000 tons, and sold as scrap on the New York market, and in 1911 the Chicago House Wrecking Company bid in the remainder for the lump sum of \$215,000.

In the sale, the United States received 68,888 shares of the capital stock of the Panama Railroad Company, and later bought from individuals 1,112 shares for \$157,118.24, giving the government complete control; and while the railroad has been operated separately from the Commission, it has been officered by members of the Commission or its employees, and in all points made subordinate to canal construction.

The value of the French engineering records and surveys, and especially of the records kept of the flow of the Chagres River, is incalculable because they could not be duplicated. It was on French records that the estimate of the amount of water to expect from the Isthmian rivers for use in the Gatun Lake was based.

THE AMERICANS IN PANAMA

Congress, on April 28, 1904, appropriated the \$10,000,000 which had been promised in the treaty to the Republic of Panama for the Canal Zone. This, with the consummation of the sale by the French company, cleared the title to the Canal Zone, and at 7.30 o'clock in the morning of May 4th, Lieut. Mark Brooke, of the United States Army, formally took over the property and the territory in the name of his government.

The day following, President Roosevelt announced the appointment of John F. Wallace, general manager of the Illinois Central Railroad, as Chief Engineer of the Panama Canal, effective on June 1st. He had acknowledged the national disbelief in governmental efficiency by going into private industrial life for a canal builder. Mr. Wallace's salary was to be \$25,000 annually, and the country recognized the selection as a good one.

Upon their return to the United States, the Commission began organizing surveying and engineering parties for pioneer work in the Canal Zone. The first ship to arrive with such a party was on May 17th, the party having at its head Maj.-Gen. Davis, of the Commission, and including Col. W. C. Gorgas, chief sanitary officer, and George R. Shanton, who personally was selected by President Roosevelt to head the police of the Canal Zone.

Maj.-Gen. Davis was in charge pending the arrival of Mr. Wallace, who reached Colon on June 24th. The President designated Maj.-Gen. Davis as Governor of the Canal Zone, on June 8th, and for the first

UNDER WAY

two months he had his residence on Culebra Hill, then in Panama. Operations were continued just as the French left them, until Mr. Wallace's arrival definitely marked the beginning of real construction.

CHAPTER XI

THE CANAL UNDER WALLACE

ANXIETY to dig dirt, the usual American desire to get things done right off, was the dominating idea in 1904. So, while Mr. Wallace kept up the surveying which would aid in determining the center line of the canal, as well as the choice of a type, he also pushed excavation operations in the Culebra cut, rehabilitating old French excavators and increasing the working force.

He had found 746 men at work with hand tools in the Culebra cut. His first inspection convinced him that the French machinery should be abandoned as fast as modern American equipment could be secured, and he expressed the opinion that two years would be required for preparations. At that time the main track and sidings of the Panama Railroad totaled 78.82 miles, while the trackage left by the French in the cut and elsewhere was 176.2 miles. The immediate substitution of heavy American rails for the Belgian type, and the double-tracking of the main line, were among Mr. Wallace's first decisions. Rolling stock and locomotives were ancient in design, and in a bad state of repair, but he rescued from the jungle and overhauled 58 locomotives and 980 dump cars.

It required stout hearts not to quail before the Isthmus of 1904. Not only the traditional unhealthfulness,

THE AMERICANS IN PANAMA

of service Mr. Wallace repaired 357 of these houses and built forty-eight new ones, still leaving the problem of housing employees unsolved. During that time more than 9,000 workers came to the Canal Zone, but the migration back to the United States, or adjacent islands and countries, was heavy.

Col. Gorgas had urged the prompt sanitation of Colon and Panama, and early in the American occupation the construction of sewers, waterworks, and paved streets was begun. The Americans advanced the money for these improvements on a plan of taxes that at the end of fifty years from their completion will repay the United States and turn them over to the respective cities.

One of the dredges left by the Slaven brothers was found to be, after twenty years, in excellent condition and was put to work in Colon harbor. The twenty miles of track in the Culebra cut occasioned derailments and wrecks with exasperating frequency until relaid with heavier rails, and this mileage was increased by an addition of fifteen miles during the first year. Machine shops existed at Colon, Matachin, and Gorgona where, when the jungle had been cut away, facilities were found for repairing machinery and rolling stock.

Mr. Wallace made his headquarters in Panama in a building that formerly had been occupied by the French Director-General. It is now the American Legation. The disbursing officer, sanitary officer, engineering parties, and clerical forces were centered in Panama, but a site for an American administrative

town was selected at the foot of Ancon hill just outside of Panama.

French towns at Culebra, Empire, and Gorgona were rehabilitated and systems of sewers and waterworks begun. There were settlements at Matachin, Bas Obispo, and Colon. Accommodations were of the crudest description. Powder boxes served for Morris chairs, furniture was scanty and of ancient design, tropical insects made life a misery, servants were worse than indifferent, there were no baths, no running water in the houses, and that which was used sometimes was caught from roofs on which the buzzards roosted, the native foods had to be eaten, and ice was a luxury that only occasionally could be obtained from the railroad ice factory at Colon.

Each ship that brought workers to the Canal Zone invariably carried the same or others back. Yet a percentage stuck and accepted the undesirable conditions gracefully. A few had vision enough to see that our great government would rectify everything if only given time. Others realized that the canal never would be built if the workers expected soft conditions right at the start and they accepted their sacrifices of comfort as a national necessity.

To add to the difficulties of the early days, magazine, newspaper, and other critics exploited the imperfections of the employee's environment from a hypercritical standpoint, whereas the government was bending its energies to the utmost to bring conditions to par. Many of these critics were inspired by a preference for the Nicaraguan route, others simply

THE AMERICANS IN PANAMA

were anti-Roosevelt and lambasted anything he championed, while still others were the hirelings of special interests that opposed any canal. These critics reached the climax of absurdity when complaint was made that men living only nine degrees from the Equator ought to have hot water baths. There was no let-up until the canal was so far advanced that it stood as a self-evident refutation of their dismal prophecies.

Every defect they pointed out had been noted long ago by the officials and was remedied in time more handsomely than any private contractor would have matched. The Americans were not attempting a pink tea performance in Panama and the torrents of abuse that were heaped upon the administration constitute the most disgraceful feature of the entire project.

Mr. Wallace came from a highly organized railroad system to an absolutely unorganized enterprise two thousand miles from the base of supplies. Government red tape to such a man was exasperating to the last degree. It was necessary for the government to advertise for bids, and this constituted the principal delay in securing orders, but barring that procedure, it has not been shown that a private contractor could have placed machinery and supplies on the ground with much greater celerity than the government.

The over-riding idea was to make a showing. President Roosevelt himself had set the pace for quick results. Congressmen who were expected to vote for canal appropriations frequently could not be impressed that the project was worth while if the dirt was not flying. Mr. Wallace therefore concentrated energies

WALLACE

on excavation work that more profitably could have been spent on preparations. He got out 741,644 yards in his year, a creditable showing with the equipment at hand. The first steam shovel was installed on November 11, 1904, and was No. 101, of the 70-ton class. It is still in use in the canal. On December 2, 1904, the second steam shovel was erected, No. 201, of the 95-ton class. By June, 1905, there were nine steam shovels at work, and the last French excavator was abandoned on June 16, 1905, the day Mr. Wallace left the Canal Zone as Chief Engineer.

All engines, cars, steam shovels, and other large equipment had to be brought to the Isthmus "knocked down." The cost of putting together a locomotive of the large type was \$820 and for erecting a steam shovel of the 95-ton class, the cost in the Canal Zone shops, is \$770. This work, with the repair work and original steel and iron construction work, required boilermakers, mechanics, blacksmiths, and machine shop workers of all kinds. Recruiting offices were opened in the principal American cities to engage them and sometimes conditions in the Canal Zone were pictured a little rosier than the facts warranted.

As Secretary of War, William Howard Taft had the immediate direction of Panama canal affairs. Every time he touched the project he manifested the high order of ability that made him so admirably equipped for the presidency later on, although the average canal employee will not agree with this opinion, because the Secretary actually acted as if the Republic of Panama was a sovereign power, entitled to consideration and

THE AMERICANS IN PANAMA

concessions in its complaints against the Commission. The canal employees were coddled by President Roosevelt and, besides, have no surplus of brotherly feeling at all for the Panamans, so that Secretary Taft's considerate treatment of them to many appeared a partiality at the expense of the canal employees.

Almost coincidental with the beginning of American operations, Panama began to feel how absolutely sovereign it had made the Americans right in the heart of the republic. The Canal Zone was being managed with complete independence from the republic, as much so as the Republic of Costa Rica to the north.

Gov. Davis had corresponded at length with the officials of Panama, over the question of sovereignty, the jurisdiction of the courts, the issues of the tariff, postage, customs, and currency, until it was deemed advisable for Secretary Taft in person to visit the Isthmus to arrange a working agreement on these differences.

Secretary Taft arrived on November 27, 1904, and remained until December 7th. He was assisted, in the conferences that were held in Panama, by William Nelson Cromwell, whose intimate knowledge of all Panama affairs made him a valuable adviser. On the question of sovereignty, which seemed to be especially delicate to the Republic, the treaty was peculiar in that it did not cede the Canal Zone finally to the United States, but gave the Americans all the powers they would exercise "if they were sovereign."

Panama contended that final sovereignty was vested in it, and Secretary Taft, being after the substance

WALLACE

rather than the form, did not quibble over this distinction without a difference, but later expressed the opinion that Panama sovereignty over the Canal Zone was a "barren ideality." Certainly it has proved so to be. The issue passed off in talk.

An agreement was reached on the currency question whereby the United States would accept the money of Panama at one half the value of American currency, that is, the peso, worth intrinsically only forty cents, would be exchanged with United States money at fifty cents, although it was in size and face value the same as our dollar. The same system was in vogue in the Philippines. To meet the needs of the canal paymaster, the circulation of pesos was increased from 3,000,000 to 4,000,000. Out of this grew the custom in the Canal Zone of referring to United States currency as "gold" and to Panama currency as "silver," and in the stores articles are priced in both currencies. The physical advantage of a high-value currency is demonstrated on the Isthmus, because the weight and size of the Panama silver money makes it cumbersome.

Stamps were selling in the Canal Zone for slightly less than in the post offices of the republic, with the result that the republic was losing revenue. Secretary Taft settled this just complaint by arranging for the Canal Zone to buy its stamps from the republic for sixty per centum of their value, the forty per centum remaining to be the profit of the Canal Zone offices. The stamps are surcharged "Canal Zone," which is the official geographical designation of the territory through which the canal runs.

THE AMERICANS IN PANAMA

On June 24, 1904, President Roosevelt had made the Dingley tariff applicable to the Canal Zone. This worked badly and Secretary Taft agreed to have the order revoked, so that the Canal Zone ever since has enjoyed the freest of free trade. All other issues were cleared up without the United States yielding any freedom of action as to importing materials, executing justice, operating ship terminals and supplying canal employees with the necessities of life through commissaries and hotels.

While Secretary Taft and Chief Engineer Wallace were working in their spheres, Gov. Davis was instituting the various departments of civil government which to-day are noted with admiration by the tourist. Chief of Police Shanton was engaged in ridding the Canal Zone of its bad men and bringing a population long without any restraint under the control of regulations that the Americans considered essential to orderly existence. So far as practicable, the laws to which the natives were accustomed, which had been handed down the centuries by the Spaniards, were adopted in taxing lands and other property, but the court procedure was American with the exception of the jury system. The judges acted as juries.

From the first Mr. Wallace had kept close tab on the cost of excavating dirt in the Culebra cut. The type to be chosen being still an unknown factor, he was in some measure working in the dark, except that the material removed would be useful for any type, provided the dumps were selected so as not to later get in the way of any route chosen. In 1912, the



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PRESIDENT TAFT.

WALLACE

Americans had to remove a French dump near Culebra to prevent its slipping down into the cut. He finally announced a unit cost of 50 cents a cubic yard for either a sea-level or lock-type canal.

Messrs. Parsons and Burr, the engineering committee of the Commission, after a personal inspection of the Canal Zone, and taking Mr. Wallace's estimate, recommended a sea-level type of canal. It was to cost, exclusive of improvements in Colon and Panama, and civil government in the Canal Zone, \$230,500,000. Mr. Wallace had caused surveys to be made for a lock type of canal, and he estimated the cost of such a canal, with a summit level of 60 feet elevation, to be \$178,013,406; with a summit level at 30 feet elevation, the cost would be \$194,213,406.

All three estimates missed the real cost of the respective types widely. Mr. Wallace's estimate of 50 cents a yard for excavation was far too low. As a matter of record, the cost reached 82 cents under Chief Engineer Stevens, rose to 91 cents under Chief Engineer Goethals, and only once fell below the 50-cent estimate, in March, 1911, when it fell to 47 cents a yard. The average for the period from 1904 to 1911 was 88 cents. The mistake was made because solid rock underlay the surface, necessitating continuous blasting before it could be handled by the steam shovels, while the working day, which had been ten hours under Mr. Wallace, was cut to eight hours under Messrs. Stevens and Goethals, and wages rose sharply as well.

Persistent and vigorous complaints from Mr. Wal-

THE AMERICANS IN PANAMA

lace, about the hindrances of governmental methods of doing business, found a receptive ear in President Roosevelt. The Executive was just as eager to make the dirt fly as Mr. Wallace, and readily agreed that a Commission of seven members was an awkward and ill-working management for the peculiar conditions of the job at Panama. Accordingly drastic action was decreed.

Secretary Taft, on March 29, 1905, asked the entire Commission to resign. His explanation exonerated the members of any blameworthy administration, but indicated that the Commission had been found an unwieldy body. Mr. Wallace was in Washington, and the President and Secretary Taft followed his suggestions almost to the letter, including the one that the Chief Engineer be made a member of the Commission.

On April 1, 1905, the second Isthmian Canal Commission to be appointed by President Roosevelt was announced. Heading it was a new figure in canal affairs, Theodore P. Shonts, who played a decisive part in the enterprise for the ensuing two years. The personnel of the new Commission was:

THEODORE P. SHONTS, *Chairman*,
CHARLES E. MAGOON, Governor of the Canal Zone,
JOHN F. WALLACE, Chief Engineer,
MORDECAI T. ENDICOTT,
PETER C. HAINS,
OSWALD H. ERNST,
BENJAMIN M. HARROD.

WALLACE

There was the same number of Commissioners, but the first three were named an Executive Committee which virtually should exercise the powers of the entire body. Thus power was taken from seven and concentrated in three members. Mr. Shonts was to be in charge of the Washington office and Messrs. Wallace and Magoon on the Isthmus.

Again following Mr. Wallace's suggestion, the directory of the Panama Railroad was reorganized, the United States on April 15, 1905, for the first time electing the members. Mr. Shonts was made president and Mr. Wallace, vice-president and general manager. This would further concentrate control in the Chief Engineer over a vital factor in canal construction.

These changes and other matters kept Mr. Wallace in Washington from March 29th to May 24th, about two months. The employees in the Canal Zone naturally caught something of the spirit of unrest which attended the reorganization of the Commission, and, of course, the hostile press was playing up everything that could embarrass the administration and damn the project. Then the yellow-fever epidemic broke out in April, 1905, to add a terrible phase to life on the Isthmus.

Having secured every change he desired, Mr. Wallace left Washington with expressions of cordial appreciation to the President and his Secretary. He arrived at Colon on June 2d, and the White House believed that a crisis in the career of the project had

THE AMERICANS IN PANAMA

been passed successfully. They looked forward to smooth sailing with every confidence.

Their surprise and chagrin, therefore, was immeasurable when Mr. Wallace cabled Secretary Taft, on June 8th, asking that he be recalled to Washington for a conference. He intimated that the conference might result in his resignation as Chief Engineer. After a disheartened interview with the President, Secretary Taft cabled him to return. At the same time he cabled Gov. Magoon for a confidential view of Mr. Wallace's conduct. Gov. Magoon expressed the opinion that Mr. Wallace was quitting for a better salary, the yellow-fever epidemic was raging, the wife of Mr. Wallace's secretary had died from the disease, and Mr. Wallace believed that he had had an attack of it.

Without intimating that he was leaving for good, Mr. Wallace quietly packed up or sold off his household furniture and sailed from Colon on June 16th. The employees scented some important movements and the subordinate officials felt restrained from decisive action, although Mr. Wallace left authority to that effect with the engineer next in rank to him.

Gov. Magoon cabled that the working force, already shaken by the yellow-fever epidemic, were further demoralized by the belief that the Chief Engineer was seeking a softer berth. Every ship that left Panama at that time was carrying capacity passenger lists, and only the limited number of vessels prevented a wholesale exodus. It was truly a time that tried men's souls.

WALLACE

President Roosevelt and Secretary Taft then decided upon a drastic course toward Mr. Wallace, as a means of reviving the morale of the canal workers, and also of bringing the American people sharply to a realization that the canal project was in peril, through a display of weakness in the face of danger, that would make our experiment in Panama an international disgrace.

Secretary Taft, with William Nelson Cromwell, met Mr. Wallace at the Manhattan Hotel in New York on June 25th. Secretary Taft listened to his reason for resigning, which in the main was that he had under consideration a position that would carry with it a remuneration of approximately \$65,000 a year. One of the peculiar conditions of the new employment was that under no circumstances was he to return to the Isthmus, but that he would gladly remain a member of the Commission resident in the United States. He made some side criticisms to the effect that Col. Gorgas was incapable of handling the yellow-fever epidemic, that government red tape was distracting, and conditions generally were such as to make the new employment look attractive.

Secretary Taft did not conceal his disappointment in Mr. Wallace's course. He began by reviewing how the government had taken him from a position paying \$15,000 a year to make him Chief Engineer of the canal at \$25,000 a year; how that the formidable obstacles to be met, the supreme necessity of a canal to the nation, made it a patriotic work for any Amer-

THE AMERICANS IN PANAMA

ican and an honor to be placed at the head of the greatest enterprise of the age.

“For mere lucre,” Mr. Taft continued, “you change your position overnight without thought of the embarrassing position in which you place your government by this action.”

Secretary Taft then reviewed how the Commission had just been reorganized to meet Mr. Wallace's wishes, and every change had been approved by the Chief Engineer. He closed by demanding the immediate resignation of Mr. Wallace. This came the next day, and was made public on June 28th, with Secretary Taft's hot rebuke, which, in the Canal Zone, had a most salutary effect. It put an entirely new complexion on their work to be told that the nation expected every man to do his duty, that they were not down there for the money they could make, nor were they expected to leave because of the hardships they would meet, but that the object of their exile was to give the nation something vital to its welfare. The desertions began to diminish at once, and the announcement on June 30th, that John F. Stevens, a Hill man, had been appointed Chief Engineer, further strengthened the morale of the canal organization.

Theodore Roosevelt never appeared to better advantage as a supremely able executive than during this crisis in the history of the canal. Before his enemies, and the canal's enemies, could shout their glee at the demoralization of the enterprise, he had closed the breach with the selection of another great Chief En-

gineer. Even if the situation had been brought about by interests with sinister designs, it could not have been met with a more magnificent courage, and the canal project was strengthened by the ordeal.

CHAPTER XII

THE CANAL UNDER STEVENS

ANOTHER notable figure in the railroad world had been chosen Chief Engineer of the Panama Canal. John F. Stevens in 1903 was general manager of the Great Northern Railroad Company, and of his selection as Chief Engineer, James J. Hill said that if the whole country had been ransacked no better man could be found.

Mr. Stevens was about to start to the Philippine Islands to superintend the construction of government railroads, when drafted for the canal. It is not possible to estimate the mischief that might have resulted if the selection of a successor to Mr. Wallace had been long delayed. His salary was to be \$30,000 annually, or \$5,000 more than that paid to Mr. Wallace. He was facing a situation in Panama that justified the figure.

The long continued "knocking" of the canal project was having its effect. Not only were the men on the ground difficult to retain, but new ones would not come unless for exceptional considerations. The yellow-fever epidemic was still uncontrolled. An invoice of the situation as left by Mr. Wallace showed that considerable pioneer work had been done, but the housing, feeding, and general preparations for the comfort of employees were unsolved problems.

STEVENS

Mr. Stevens arrived at Colon on July 27, 1905. As a railroad man his eye first was attracted by the congestion of freight on the wharves and the self-evident fact that the Panama Railroad was in a near state of collapse. Freight was piled up in the streets in prodigious quantities and was moving over the railroad at a snail's pace. His first report hit off the situation in one sarcastic sentence:

"About the only claim for good work heard made was that there had been no collisions for some time. A collision has its good points as well as its bad ones—it indicates there is something moving on the railroad."

As for the railroad tracks in the Culebra cut, he said they were "lines, which by the utmost stretch of the imagination could not be termed railroad tracks." Mr. Wallace had found the Panama Railroad, after half a century without competition, far behind the times in equipment, and practically no discipline or efficiency existed among the employees. When Mr. Stevens took charge there was an improved situation, but the long absence in Washington of Chief Engineer Wallace, and his sudden departure, had caused the railroad to begin a retrograde movement.

For 31 miles the main line of the railroad had been retracked with American rails and the work of double-tracking it was just getting under way. The principal shops were at Matachin, with a capacity of overhauling five locomotives and 150 dump cars a month. The canal employees soon saw the caliber of man at their head by the way Mr. Stevens straightened out

THE AMERICANS IN PANAMA

the railroad tangle, for the freight began to move, lax methods were rooted out of the system, and the semblance of an efficient organization, operating along modern lines, appeared.

The Commission visited the Isthmus in July and August and with Mr. Stevens reached the conclusion that construction work should be reduced to a minimum, even to turning away employees, and all energies bent to building up a system of feeding and housing the men and their families. Preparatory work was given the right of way over construction, which accounts for the comparatively little excavation done under the Stevens régime. The general verdict was that the ground work done by Mr. Wallace was good, in spite of disorganized conditions, and that no insuperable obstacles stood in the way of building the canal. Delays in filling requisitions undoubtedly accounted for the lack of some of the equipment and supplies.

Mr. Wallace had left the following organization worked out on paper, with the explanation that large salaries had not attracted competent heads of departments, so that Mr. Stevens found many important positions unfilled:

The Department of Engineering and Construction was divided into five divisions, running from the Atlantic to the Pacific and known as the Colon, Chagres, Gamboa, Culebra, and La Boca Divisions.

Bureau of Personnel, Transportation and Quarters.
Bureau of Supplies.

STEVENS

Bureau of Waterworks, Sewers, and Roads.

Bureau of Machinery and Equipment.

Bureau of Architecture and Equipment.

Bureau of Meteorology and Hydraulics.

Bureau of Mapmaking and Printing.

Bureau of Communication.

There were 8,312 men in the department of engineering and construction, and other employees brought the total to 9,500, not including the Panama Railroad. Municipal improvements in Colon and Panama, and certain Canal Zone towns, were well under way. Effective progress had been made in the work of surveying the canal route, in making borings for lock sites, and in other engineering preliminaries. As noted, 741,644 yards had been excavated and nine steam shovels were at work. The 357 renovated French buildings and 48 new structures housed the employees, except those who provided shelter for themselves in Colon and Panama. There were no commissary and hotels.

On December 1, 1905, the Commission made its annual report to the President, containing Mr. Stevens' first review of the canal. Both he and the Commission pleaded for "a thorough business administration, unhampered by any tendency to technicalities, into which our public works sometimes drift." Like Mr. Wallace, Mr. Stevens found government red tape galling. Civil service and the eight-hour day were just as obnoxious, the Commission urging that "it is a mistake to handicap the construction of the Panama

THE AMERICANS IN PANAMA

Canal with any laws save those of police and sanitation."

An Executive Order had made the Civil Service cover the Canal Zone on November 15, 1904, but both Mr. Wallace and Mr. Stevens protested so earnestly against the restrictions of this order that on January 12, 1906, President Roosevelt removed all employees, except clerks, from the scope of the act, thus allowing Mr. Stevens to employ anyone he saw fit on any terms he chose. The eight-hour day restriction likewise was lifted, but agitation in the United States caused the President later to reimpose both limitations, with whatever increase in time and cost of constructing the canal they might involve.

The Americans had been in Panama more than a year, and still the type of canal to be built was undecided. Mr. Wallace's service had terminated and a full year of Mr. Stevens' administration before the choice was made. In the meantime, Mr. Stevens rapidly was rounding into shape an organization of workers, getting suitable quarters erected for the employees who were coming in large numbers, organizing the commissary and hotel systems, securing mechanical equipment, and bringing the transportation facilities to a satisfactory standard. Gov. Magoon simultaneously was organizing a civil government along the lines blazed by Gov. Davis. Police, courts, schools, fire departments, post offices, recreation club-houses, churches, in short, duplicating on a scale suitable to the Canal Zone the civilization of the United States.

STEVENS

By June, 1906, the end of his first year as Chief Engineer, Mr. Stevens had made a remarkable showing in every phase of the work. There were 39 steam shovels at work as against 9 in 1905; the working force had increased to 23,901, of whom 3,264 were Americans. But, as showing how closely his efforts were concentrated on preparatory work, the total excavation for the year was only 1,499,562 yards, the highest figures for one month being in March, 1906, when 239,178 yards were removed.

Col. Gorgas and his sanitary department got on top of the yellow-fever epidemic in September, 1905, and in general so dominated the hitherto unhealthful Isthmus, that even the hostile press began to show a change in heart on this score, with the result that the immigration of workers largely increased. Recruiting agencies already had been opened in the West Indies, Europe, and the principal American cities. More than 12,000 men were imported in 1906 on contract with the Commission. The common labor was estimated by Mr. Stevens to be about 33 per cent as efficient as similar American labor. It was not until 1906 that the wives and families of the Americans began coming to the Canal Zone in considerable numbers, although there had been a heroic band of them throughout the trying days before the tropical terrors had been conquered.

Early in his connection with the canal, Mr. Stevens discovered that practically all the material in the Culebra cut would have to be blasted before it could be handled by the steam shovels. "The problem of Cu-

THE AMERICANS IN PANAMA

lebra cut," he wrote in the first annual report, "is one of transportation (including disposal) pure and simple." He had to be careful in selecting dumps so as to insure that they would not become an obstruction to any type of canal or route that might be selected. "As the gift of prophecy is withheld from us in these latter days, all we can do now is to make such arrangements as may look proper as far ahead as we can see," he wrote in his report of 1905 on the unsettled question of a sea-level or lock-type canal.

The high wages and salaries for which the Canal Zone is noted originated under Mr. Stevens. So bad a name had been given the Isthmus in the past that extra inducements had to be made to attract workers, free quarters, pay from 30% to 60% higher than in the United States, and a rate of \$20 from New York to Colon on steamers operated by the government, with other perquisites, being some of the advertised attractions. Besides, in the latter part of Mr. Stevens' régime, the United States was enjoying unexampled prosperity, the palmy days before the panic of 1907. Mechanics and all kinds of workers could obtain employment at home at high wages and would not come to Panama unless for the unusual inducements enumerated, and, in addition, vacations with full pay, sick leave on pay, and cheap food and other necessities.

THE BATTLE OF THE LEVELS

Although the French had abandoned the idea of a sea-level canal in favor of a lock type, there still was



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JOHN F. STEVENS.

a good deal of life in the idea among the American people. For one thing, a sea-level canal was so much more easily grasped by the popular mind, and then all engineers concede that it is the ideal canal where it is practicable. In Panama, the division of opinion arose over this point of practicability.

A sea-level canal aptly has been described as "a wide and deep passage navigable at all times, day or night, at all seasons and in all weathers, by all sorts and sizes of vessels." The lock type involves operations not readily portrayed to the lay mind, but eminently simple when seen in practical use. Popular opinion, and the daily and periodical press, divided and fought bitterly from the time the Canal Zone was taken until it finally was decided by Congress, and even then the sea-level advocates kept up an anvil chorus against the lock type.

The Walker Commission of 1901 had estimated the cost of a sea-level canal at \$145,000,000. The Spooner act authorized \$135,000,000 for any type that might be chosen, but leaned toward the lock type. The Commission of 1905 recommended a sea-level type to cost \$230,500,000. Mr. Wallace later estimated the cost at sea-level at \$300,000,000, exclusive of the \$50,000,000 paid for the Canal Zone and French property.

That these American estimates should come, in the main, under the amount actually spent by the French, who little more than scraped the surface, shows, for one thing, that the Americans believed there had been gross extravagance and inefficiency in the French oper-

THE AMERICANS IN PANAMA

ations, and for another thing, that the Americans had no adequate grasp upon the task they were undertaking. This same insufficiency of estimates continued until 1908, when Col. Goethals faced the situation frankly and announced the cost for a lock type to be \$375,000,000, which was far ahead of the highest estimate for a sea-level canal. In 1909, Col. Goethals said a sea-level canal would cost \$563,000,000 and take six years longer to build than a lock canal, which was before the slides in the Culebra cut became so formidable and a sea-level canal had been shown thereby to be all but impossible. It is probable that a sea-level canal would cost around a billion dollars, and take from ten to twenty years longer to build, if engineers should now decide it practicable.

President Roosevelt took a characteristic step to end the dispute. On June 24, 1905, a few days before the appointment of Mr. Stevens as Chief Engineer, he named the following International Board of Advisory Engineers to recommend a type of canal:

MAJ.-GEN. GEORGE W. DAVIS, U. S. A., *Chairman*,
CAPT. JOHN C. OAKES, U. S. A., Corps of Engineers,
Secretary,

BRIG.-GEN. HENRY L. ABBOTT, U. S. A., retired,
ADOLPH GUERARD, Inspector-General of Public
Works, France,

EDOUARD M. QUELLENEC, Consulting Engineer, Suez
Canal,

HENRY HUNTER, Engineer of Manchester Canal,
England,

STEVENS

HERR EUGENE TINCAUSER, Engineer on Kiel Canal,
Germany,

J. W. WELCKER, Engineer Dyke System, Holland,

ISHAM RANDOLPH, Chief Engineer, Chicago Drainage
Canal,

FREDERICK P. STEARNS, Hydraulic Engineer, Boston,

WILLIAM H. BURR, Consulting Engineer, New York,

JOSEPH RIPLEY, Chief Engineer, Sault Ste. Marie
Canal,

ALFRED NOBLE, Chief of Pennsylvania R. R. Im-
provements, N. Y. C.,

WILLIAM B. PARSONS, Chief Engineer, Subway Sys-
tem, New York.

Out of this number, five were foreigners and the remainder Americans. The Board visited the Isthmus in October, 1905, and reported to the President on January 10, 1906. The majority, composed of eight engineers, and comprising all of the foreigners, recommended a sea-level canal. Messrs. Davis, Burr, and Parsons were the three Americans who signed the majority report. The minority of five Americans recommended a lock-type canal with a lake at 85 feet above sea-level formed by a dam across the Chagres River at Gatun. They estimated the excavation at 103,795,000 cubic yards, and the cost, exclusive of sanitation and civil government, at \$139,705,200. Nine years, or until 1915, was the time estimated for completing the canal. There were to be three locks in flight at Gatun, each 95 by 900 feet usable dimensions, and on the Pacific side, one lock at Pedro

THE AMERICANS IN PANAMA

Miguel, and two at La Boca, at the entrance, the distance between Pedro Miguel and La Boca, 8 miles, to be a second artificial lake. The Culebra cut was to be 200 feet wide for 5 miles and 300 feet wide for 4 miles.

Chief Engineer Stevens and all but one member of the Commission concurred in the minority report. Secretary Taft's visits to the Isthmus had converted him to the lock type, and President Roosevelt consistently had favored it.

The situation was one where the choice would be decided by the weight the President should throw to either report. To reject the majority report favoring a sea-level canal, and to advocate the minority report for a lock-type canal, was a responsibility of unusual magnitude for an Executive who professed to have no technical engineering knowledge. Yet President Roosevelt made the momentous decision without hesitation, sending a strong message recommending the minority report. It was, perhaps, the greatest crisis in the history of the project, and the American people have to thank his sound judgment in preventing a sea-level experiment that, undoubtedly, in the light of recent years, would have exhausted the patience and maybe the finances of the nation.

Congress debated the issue until June 21st, when the Senate by the close vote of 36 to 31 decided for a lock type, and on June 28th, the House concurred, the bill becoming law on June 29, 1906. The sea-level advocates were beaten, but they watched operations sullenly and flared up into hot criticism fre-

quently, with dismal prophecies of the impending collapse of the lock canal.

Of the three Chief Engineers who have directed the construction of the canal, Mr. Wallace alone favored the sea-level plan. He uniformly opposed a dam at Gatun, expressing the opinion that there was not a foundation at that point for so heavy a structure, nor did he believe from his investigations that the earth there would support the great locks contemplated in the minority report. Any type of canal, he reasoned, which would require years to repair a break was inadvisable, and even a lock type should be convertible to a sea-level canal, if such action should appear desirable. Messrs. Stevens and Goethals were equally unwavering in their advocacy of a lock canal.

Two years and two months had passed from the time the Americans came to Panama, in May, 1904, to July 1, 1906, before this decision was made, and at last the Commission knew what plan of canal was to be followed. In September, 1906, Mr. Stevens started the excavations in the sites for the Gatun locks, the Pedro Miguel lock, and the Gatun Dam Spillway. Surveys were begun for relocating the Panama Railroad which, for a considerable distance, would be swallowed up by the completed canal. The fifteen months' preparatory work was beginning to tell in the increased excavations in the Culebra cut as the organization was getting its stride. Commissaries, which sold everything the canal employee needed, were in operation in the principal towns, the hotels for the bachelors were well organized, quarters had

THE AMERICANS IN PANAMA

been erected until all were housed, though at times rather crowded, machinery, supplies, and equipment were on hand, or ordered, to the extent of 80 per cent of what would be needed to complete the canal, health conditions were admirable, and the whole situation was shaping for the real work of building the canal.

President Roosevelt paid the Canal Zone a visit in November, 1906. It was a trip of exploration for him, and the way he ignored the formal plans for his entertainment delighted the employees. Subordinate officials were rather anxious that he should inspect just the things they had spick and span for him to inspect, but from the time he landed at Colon, where he jumped on a horse instead of into a waiting carriage and rode down the unpaved side streets, noting the mud and unfinished improvements, until he ate in the line hotels with the dirt-covered employees, inspected the kitchens and quarters, and had nosed in and out of every part of the canal, he led them a merry chase. The enthusiasm for the "daddy" of the project was boundless, and the shortcomings he noted resulted in better conditions of employment for the men.

One evidence of the growing luxury of living conditions in the Canal Zone was the installation on January 1, 1907, of electric lights in the quarters of the married and bachelor employees at Empire and Culebra. Other towns soon were furnished with electricity. The first public school had been opened a year before this event, or on January 2, 1906. Gov. Magoon, on September 25, 1906, had been transferred

STEVENS

to Cuba by the President, occasioning the first break in the Shonts Commission. The summer and fall of 1906 and the winter of 1907 saw another great controversy raging around the canal, which, like the battle of the levels, was to be decided arbitrarily by President Roosevelt.

THE CONTRACT PLAN

Chairman Shonts long had entertained the opinion that the canal should be constructed by private contractors. He pressed the plan so vigorously, and the popular opinion of the inefficiency of the government was so strong, that the President authorized Secretary Taft to ask for bids on October 9, 1906.

By this time conditions had so improved in the Canal Zone that the employees viewed the assumption of control by contractors as likely to militate against their interests. Mr. Stevens was making admirable headway, both in the creation of an effective organization and the physical equipment to do the actual work of construction. He had little enough patience with governmental methods, but on the point of securing competent workers, which Mr. Shonts seemed to think the government could not do so speedily and well as a contractor, Mr. Stevens said in his report of 1905: "The very liberal and wise policy which the Commission is carrying out in its care of its employees and in its treatment of them in every way must, after patient and careful selection, result in a personnel entirely capable of producing good results."

The plan Mr. Shonts advanced for turning the job

THE AMERICANS IN PANAMA

over to a private contractor, left in the hands of the government the last word on every vital question that might arise. Viewed to-day, the terms of the invitation for bids seem to have been drawn with so much rigidity as completely to have robbed any contractor of the very flexibility of action which appeared to be the main drawback of a government enterprise. The government was to decide upon the cost and plans and the contractor was to receive a percentage of that amount for his services. Civil government and sanitation were to remain in the hands of the government.

It is safe to assume that had the plan been adopted, it would have broken down in less than three months, because the contractor either would have settled to the mere foremanship of the job, with the government engineers the court of last resort on all issues, or he would have asserted an independence of judgment and action which the terms of the contract did not permit. Either result would have been disastrous to the canal project.

Those who favored the contract plan had some considerations which were potent with them, but which they did not shout from the housetops. They knew that the terms of the contract on which bids were invited practically reduced the contractor to the position of superintendent, but by nominally placing the work in his hands they would get the private contractor's freedom of action as to hours of work, standard of wages, fitness of employees, and cheapness of markets for materials. In other words, so long as the

STEVENS

government itself built the canal, the eight-hour day, civil-service regulations, and the whole web of official procedure that enveloped the undertaking, would be operative. The contract plan offered a neat way of sidestepping these cumbersome conditions of doing business.

Mr. Wallace heartily favored the contract plan, expressing his belief in "the utter impossibility of the United States Government carrying on a constructive enterprise in a common sense, businesslike manner." Whatever his attitude at first, toward the last Mr. Stevens opposed the contract plan, as he believed that the work he had done in the Canal Zone was efficient, and if a little relaxation in red tape was indulged, the canal could be built more advantageously by the Government.

Bids for constructing the canal by private contract were opened at Washington on January 12, 1907, and rejected on the ground that they failed to meet the requirements of the government. The Oliver-Bangs syndicate was nearest in its bid to the specifications. The real reason for rejecting the bids was that both the country and the administration had undergone a change of heart as to the wisdom of the contract plan.

Another epoch in the life of the canal project was marked by the President's action in definitely committing the enterprise to direct government supervision. Chairman Shonts resigned, effective March 4, 1907. An executive order then consolidated the offices of Chairman and Chief Engineer in Mr. Stevens. On March 16th the remainder of the Commission, except

THE AMERICANS IN PANAMA

Col. Gorgas, resigned, to be followed on April 1st by the resignation of Chief Engineer Stevens. His resignation came like a sickening accident to the canal employees. "The Chief," as he was called familiarly, had established himself firmly in their minds and hearts as a thoroughly competent engineer and just administrator. No official explanation of the motive for his quitting had been made, but the general understanding is that he opposed the assignment of government engineers to the Commission as likely to create friction with civilian engineers and partly to a stiff communication he sent the President on the limitations of red tape and governmental methods generally. His departure was featured by a remarkable demonstration at Colon, when he was presented with a gold watch, a diamond ring, and a silver service by the employees, who did not restrain their emotion at his loss.

Mr. Stevens was not soured by the termination of his services as Chief Engineer. His faith in the ultimate success of the project has remained unshaken, and in the *Engineering News* of December 31, 1908, a year and three quarters after his resignation, he wrote that the public criticism of the locks and dams was erroneous, and advised that Col. Goethals be backed up in his admirable efforts. The greatest tribute to his work as Chief Engineer is found in the fact that the organization of employees was so thorough and the foundational work so well done that the enterprise was not harmed by a change in managing directors.

CHAPTER XIII

THE CANAL UNDER GOETHALS

PRESIDENT ROOSEVELT had at last found public sentiment educated to the point where the canal could be put exclusively in the hands of government engineers, following the untimely resignation of Mr. Wallace, the belief that private interests were seeking to grab the project, and the loss of Mr. Stevens. It had taken three years to reach this attitude. The personnel of the third Commission he appointed, on April 1, 1907, was as follows:

LIEUT.-COL. GEORGE W. GOETHALS, *Chairman and Chief Engineer,*

MAJ. D. D. GAILLARD, U. S. A.,

MAJ. WILLIAM L. SIBERT, U. S. A.,

MR. H. H. ROUSSEAU, U. S. N.,

COL. W. C. GORGAS, U. S. A., *Medical Corps,*

MR. J. C. S. BLACKBURN,

MR. JACKSON SMITH,

MR. JOSEPH BUCKLIN BISHOP, *Secretary.*

The President also took advantage of the reorganization of the Commission to further consolidate power in the Chairman. Not only was Col. Goethals made Chairman of the Isthmian Canal Commission, and Chief Engineer of the Panama Canal, but the executive power in the Canal Zone, formerly exer-

THE AMERICANS IN PANAMA

cised by the Governor, was vested in him, as well as the Presidency of the Panama Railroad Company, thus making every official and employee, and the members of the Commission, subordinate to him.

In former years the Governor had exercised extensive and supreme powers within his sphere, ranking higher than the Chief Engineer. Where the Chairman, Chief Engineer, and Governor had rival powers, friction was sure to develop, and did so develop. Under the new order the Governor was reduced to the title of Head of the Department of Civil Administration, reporting to the Chairman, as did the Chief Sanitary Officer and Division Engineers. Thus the former concentration of the power of a Commission of seven members into an Executive Committee of three, was still further concentrated into one man and so gave Col. Goethals the absolute authority he ever since has exercised in the Canal Zone, acknowledging only the Secretary of War and the President as his superiors.

Mr. Jackson Smith's appointment to the Commission is the only instance of a civilian coming to the Canal Zone as an employee and attaining to the position of Commissioner. He had shown such remarkable ability as the head of the Bureau of Labor, Quarters, and Subsistence, in recruiting workers, housing them and supplying them with food, that his services were recognized by elevation to the Commission. Mr. Blackburn, of Kentucky, was the head of the Department of Civil Administration, and Mr. Bishop was to edit a weekly Canal Record, the official Commission

GOETHALS

publication, the first issue of which appeared on September 4, 1907, and every Wednesday since. Five of the new Commissioners and the Secretary have been on the job continuously from that day to this, the changes coming in the other two members on September 14, 1908, when Mr. Smith resigned and was succeeded by Lieut.-Col. H. F. Hodges, and Mr. Blackburn being succeeded by Mr. Maurice H. Thatcher, on April 12, 1910.

Col. Goethals appreciated the feeling the employees had over the prospect of army engineers for directors of the enterprise, and in his first speech in the Canal Zone dispelled the idea of militarism in the canal management. He promised a fair hearing to every man with a grievance, the manner in which he carried out this promise being one of the distinctively great qualities he later revealed as an administrator. Few persons in the Canal Zone had heard of Col. Goethals before his appointment as Chief Engineer. He had visited the Isthmus in 1905 to study it with a view of recommending plans for fortifications, but the employees who had been with the job then scarcely were impressed by his presence. Yet, his previous experience had qualified him ideally for the important work now in hand. He had been building locks and dams, had been Chief of Engineers in the Spanish-American War, was a graduate of and had taught in West Point, and had seen other construction experience that made him at home in any kind of work the canal should require. Messrs. Stevens and Wallace lacked his knowledge of lock building, and they lacked the

THE AMERICANS IN PANAMA

military point of view which was to become essential in directing the fortification work, and the general policy of treating the Canal Zone as a military reservation, even though the project is neutral and open to the nations of the world.

Looking back from this perspective of years it seems fortuitous that the canal has had the impress of both civilian and army engineers. When Mr. Stevens left, the enterprise was ready for just the treatment it has received under Col. Goethals, which is, that we are not investing \$375,000,000 as a mere adjunct to commerce, but as a means of national defense vitally necessary. The military coloring Col. Goethals has given the canal will not impair its utility in the world's trade, yet it will keep it ready for the emergencies of war in a manner that the civilian view point hardly could have been expected to produce.

Contrast, for a moment, the situation as faced by Col. Goethals with that faced by Mr. Stevens in 1905. In 1907, fire was under the boiler and steam was up. When Mr. Stevens relinquished the throttle, the army of workers had begun to come close to the million mark in monthly excavations in the Culebra cut. There were 63 steam shovels at work on the canal; 100 French and 184 American locomotives, and 2,700 cars of all kinds were in use; the Panama Railroad had been double-tracked throughout, and the mileage in the Culebra cut and elsewhere brought up to 106.78 miles; 18 Lidgerwood unloaders, 13 bank spreaders, 33 unloading plows, 3 track shifters and 7 pile

drivers were in service; the machine shops at Gorgona and Empire were equipped for any kind of repair work or original construction.

There were approximately 30,000 employees, and the recruiting agencies in Europe, the West Indies, and the United States constantly were sending additions. Quarters for employees, office buildings, and all other structures consisted of 2,009 buildings of American design, and 1,536 remodeled French buildings. The commissary for supplying food, clothing, and general merchandise to employees was organized and had branches in seven Canal Zone towns. There were fifteen hotels in operation for bachelor employees and four recreation clubhouses had been constructed, beside church and lodge buildings. Twenty-four public schools afforded educational facilities to the Canal Zone children. The police system, the courts, post offices, and fire departments were thoroughly organized. In short, the preparatory stage of the canal had passed and the constructive stage had begun.

As compared with the total excavation required for the completed canal, in round numbers 221,000,000 yards, the record made by Mr. Stevens, in removing from the Culebra cut during the twenty-one months he was Chief Engineer, 5,073,098 yards, is not significant. The construction of the canal distinctly is the work of the Goethals administration; still, the preparatory work had to be done because, as Col. Goethals himself states:

“It was only after these various yet necessary adjuncts had been provided and the forces for their

operation were organized that the principal work in hand—the building of the canal—could be pushed forward with any hope of success, and too much praise cannot be given those who conceived and established them in a working condition.”

Necessarily, all the basic work accomplished under Wallace and Stevens is lost sight of in view of the magnificent superstructure erected under Col. Goethals. The modern sightseer has nothing to remind him of the wretched conditions of the first two years, the battle with disease, the arduous labor of creating in the jungle a duplicate American civilization, the tantalizing struggle with government red tape before a stick of timber, a pound of iron, a shipment of food, or an efficient workman could be secured.

The first vivid impression to-day upon the tourist viewing the colossal locks and the artificial canyon called the Culebra cut, the beautiful towns, and the whole paraphernalia of a well-ordered civil government is similar to that experienced upon the first sight of Niagara Falls, with this exception: The Panama Canal is the work of man, and the responsibility for it may be fixed. An outburst of praise is the spontaneous result, and Col. Goethals, being the visible head of the project, naturally bears the brunt of this admiration. Yet, excluding the construction work, all the collective activities, such as feeding and housing and providing for the needs of the army of employees, as well as the whole civil government, was the work of the Stevens and Wallace administrations.



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COL. GEORGE W. GOETHALS.

GOETHALS

Col. Goethals simply has enlarged the organizations they left.

Perhaps the chief reason that Col. Goethals so generally is accepted as the sole genius of the canal is found in the fact that he stuck to the job which two others had abandoned. Justice, however, is not wholly served by this consideration. A simile may be found in the task of breaking a broncho. The canal job threw both Wallace and Stevens and then Goethals stuck in the saddle. But the energy that the broncho spent to dismount the first two riders so weakened him that by the time the third was in the saddle he was conquerable. The third rider may have been no better than the two who were thrown, and their efforts undoubtedly paved the way for his success.

Col. Goethals deserves the admiration that his service on the canal has evoked, but the generality of writers, looking at what exists to-day and heedless of the beginnings of the task, lose their perspective and commonly fall into the error of ignoring the very remarkable and wholly vital preparatory work under John F. Stevens. This writer believes that if Col. Goethals had been selected in 1904, there only would have been one Chief Engineer of the canal, barring his death, so eminent are the abilities of the army engineer, but candor requires the statement that he assumed control at a time when conditions were soft as compared with the early stages of the project.

President Roosevelt had selected in Messrs. Gailard, Sibert, Rousseau, and later, Hodges, engineers

THE AMERICANS IN PANAMA

of exceptional ability, who, with S. B. Williamson, picked by Col. Goethals, demonstrated capacities which in a large measure account for the splendid progress of the Goethals administration. Any one of them would have been available for the highest position in the organization.

It would be erroneous to assume that Col. Goethals had nothing to do but sit back and watch the signals on the main line of canal construction, as indicated by his predecessors. The decks, indeed, had been cleared for action and the blue-prints nicely finished and tied with ribbon, but the real struggle was just beginning. He had the tools for the job placed in his hands, but their skillful use devolved entirely upon him. Besides, changes were made in the original plans and unanticipated problems arose, which made Col. Goethals' direction of the enterprise in the highest degree complex and exceptional.

The first annual report of the Commission, to be written as of June 30th, the end of the government's fiscal year, was issued by Col. Goethals in 1907, three months after Mr. Stevens resigned. The President had asked Col. Goethals to report on the contract plan after an inspection of the canal, and this masterly argument against turning it over to private contractors is the report's most notable feature, aside from its unusual comprehensiveness. Incidentally, the argument is a high tribute to the work of Mr. Stevens.

Col. Goethals pointed out that the canal required special equipment which would be useless to a contractor after its completion, and therefore could be

GOETHALS

bought just as cheaply by the government; that the government had had more experience in lock building than any contractor, and had had sufficient experience in dredging and excavating to insure economy. When the profits a contractor would make were deducted, the government could equal his efficiency. He pointed to the Congressional Library at Washington as an example of work done satisfactorily by the government. No contractor had an organization that could cover all phases of the canal, and the government already had as good an organization as any contractor could get. The French had tried the contract system, antagonizing labor thereby, and Italy already had served notice that its citizens could not work in the Canal Zone if the government abandoned the job. Finally, endless friction between government inspectors and the contractor would result, and on the side of civil government and sanitation the contractor could not possibly equal the efficiency of the government.

Taking a survey of the conditions when he took charge, Col. Goethals found that 80 per cent of the plant for finishing the canal was on the ground or ordered. The preliminary work for relocating the Panama Railroad had been done, and actual construction of the new line was begun in June, 1907, shortly after his arrival. Excavations in the lock sites were uncompleted, and it was two years later, in 1909, before any concrete was laid. In April, the month he arrived, nearly 900,000 yards were removed from the Culebra cut, the best month's work to that date. By

THE AMERICANS IN PANAMA

December, 1907, the million mark for the Cut was passed and never has been lowered except for one month, May, 1908. Dredging in the Atlantic and Pacific entrances of the canal had gone ahead steadily, though not extensively, the amount removed in the Atlantic entrance being 1,732,712 yards, and in the Pacific entrance, 1,956,895 yards, from 1904 to April 1, 1907. Less than 6,000,000 yards had been removed from the Culebra cut by both Wallace and Stevens.

In August, four months after Col. Goethals arrived, the organization in the department of construction and engineering had developed such a momentum that it was necessary to ask authority from the President to exceed the regular appropriation by \$8,000,000 for the fiscal year to end in June, 1908. This is additional evidence of the efficiency of the preparatory work under Mr. Stevens.

The fall of 1907 and the month of October presented a new problem in the canal construction which ever since has been one of the most formidable and uncertain factors in the project. A slide began at Cucaracha on the east side of the Cut near the town of Culebra and suddenly filled the Cut, closing it for transportation. In 1884, the French had noted this earth movement, and during Col. Goethals' first years on the canal it involved an area of forty-seven acres. Before dirt trains could move through the Cut, steam shovels had to work night and day for several weeks, and from that time onward the slides have been the bugbear of the organization, not because they were insuperable, but from the extra work they involved

GOETHALS

and the possibility that they might delay the completion of the project. In the closing days the slides are still the unknown factor.

Right then it was realized that the canal involved more excavation than the minority of the Board of Advisory Engineers had estimated. Several important changes in the plans for the canal came within the first eighteen months of the Goethals administration to make the job far more stupendous than contemplated in the plans of 1906. Col. Goethals recommended, and President Roosevelt approved on December 20, 1907, a change in the location of two of the Pacific locks. The revised plans changed two locks from La Boca, on the Pacific coast, to Miraflores, about seven miles inland, which not only would make them safe from bombardment, but was a more practicable engineering plan. A mile and a half farther inland were the Pedro Miguel locks, which would raise ships the final height to the great Gatun Lake, at its Pacific terminal, and between the Pedro Miguel and Miraflores locks was a small artificial lake. From Miraflores to the Pacific, a sea-level channel 500 feet wide was to be dug.

Another change in the plans was approved by the President on recommendations by the Navy Board, on January 15, 1908. The locks were ordered enlarged from 95 by 900 feet to 110 by 1,000 feet, usable dimensions, to meet the anticipated increase in the size of commercial and war vessels. Col. Goethals did not think a width of 110 feet necessary, favoring 100 feet width, but his judgment in this

THE AMERICANS IN PANAMA

instance has proved to be wrong, as the latest Argentine battleship is 98 feet wide, leaving only 12 feet surplus in the width of the locks, at 110 feet. The *Pennsylvania* of our Navy will be 97 feet wide, leaving 13 feet, or $6\frac{1}{2}$ feet on each side of the ship in the locks. The *Imperator*, the latest giant of the Hamburg-American fleet, is 96 feet wide and 900 feet long, so that it appears that the locks may become too narrow before they become too short. The cost of the locks was increased \$5,000,000 by the change in plans.

A third vital change in the original plans came on October 23, 1908, when the President authorized the widening of the Culebra cut for five miles from 200 feet to 300 feet at the bottom. This would enable ships to pass going in opposite directions anywhere in the Cut, and increased the cost of this part of the canal by \$14,000,000. Since these three important changes there have been no substantial changes in the canal plans, except the decrease in the proposed height of the huge Gatun dam. Additional excavation to the extent of 70,871,594 cubic yards was necessitated by the new plans over the estimate of 103,795,000 yards made in 1906, or a total of 174,666,594 yards for the completed canal. But slides that later developed, and further changes in the plans since 1908 have added 47,000,000 yards to that total, bringing it up to 221,000,000 yards. Thus Col. Goethals has had to dig more than twice as much dirt as Mr. Stevens expected to take out, and is doing it in less time than was estimated for the original yardage! The original canal of 103,795,000 yards was dug by the Americans

GOETHALS

by April 6, 1910, six years after work began, and two years and a half of that time had been spent in preparatory work.

Basing his figures on the revised plans, Col. Goethals in 1908 issued the following estimate of the cost of the Panama Canal:

ATLANTIC DIVISION—7 MILES

Breakwater in Limon Bay.....	\$11,432,000
From Caribbean Sea, channel to Gatun Locks.....	17,736,000
Gatun Locks, three twin locks.....	25,824,000
Gatun Dam.....	13,572,000
	\$68,564,000

CENTRAL DIVISION—32 MILES

Channel from Gatun Locks to Bas Obispo	\$7,977,000
Culebra Cut, Nine Miles, Bas Obispo to Pedro Miguel Lock.....	80,481,000
	\$88,458,000

PACIFIC DIVISION—8 MILES

Pedro Miguel Lock.....	\$12,693,000
Pedro Miguel Dam.....	251,000
Miraflores Locks.....	19,715,000
Miraflores Dam.....	2,156,000
Channel, Pedro Miguel to Pacific....	13,170,000
	\$47,985,000

THE AMERICANS IN PANAMA

New Panama Railroad.....	\$8,164,000
Land Damages.....	500,000

GENERAL ITEMS

Municipal Improvements.....	\$12,114,000
Buildings	14,651,000
General Expenses, Salaries, Subsistence, etc.	23,730,000
Loans to P. R. R.....	8,300,000
Contingencies	20,000,000
Lighthouses, Ships, Wharves.....	3,850,000
Double-tracking, Land and Stock Purchases	1,450,000
	\$84,095,000

Grand Total Cost of Construction.. \$297,766,000

ALL OTHER ITEMS

Sanitation	\$20,053,000
Civil Administration	7,382,000
Paid for French Property.....	40,000,000
Paid for Canal Zone.....	10,000,000
	\$77,435,000

Total Cost for Completed Canal... \$375,201,000

Beginning July 1, 1908, Col. Goethals initiated changes in the organization, which was to be the final one for the canal. The Department of Engineering and Construction was divided into three grand divi-

GOETHALS

sions, to be known as the Atlantic, Central, and Pacific. The Atlantic division comprised that part of the canal which extended from deep water in the Caribbean Sea to, and including, the Gatun locks and dam, about seven miles of the canal. The Central division comprised the channel through the Chagres River valley from the Gatun Locks to Bas Obispo, where the Culebra cut began, and for nine miles through the continental divide to the Pedro Miguel Lock, about thirty-two miles of the canal. The Pacific division comprised the Pedro Miguel Lock and Dam, the short channel to the Miraflores Locks and Dam, and including those features, and the channel to deep water in the Pacific, about eight miles of the canal.

Of the forty-seven miles of the canal proper, the Central division had the greatest mileage, its construction was to be the costliest and the material handled to be far in excess of either of the other two divisions. It is in the Central division that the main excavation of the canal has been made, as the mountain chain had to be pierced with a cut, the bottom of which would be only forty feet above sea-level, necessitating digging down from the highest point on the surface, a depth of 272 feet, between Gold and Contractor's hills. The French dug down 161 feet at this point, but not so wide as the American plans required so that considerably more than 111 feet depth remained for the Americans to dig. From this highest point the mountains slope toward the Atlantic and Pacific with a consequent lessening of the depth of the excavations

THE AMERICANS IN PANAMA

to reach the proposed bottom of the canal. Practically all the material had to be blasted before removal.

Since 1908 the organization has remained unchanged as to the heads of the divisions in the department of engineering and construction. As finally designed by Col. Goethals, the organization of the canal forces is as follows, with the incumbents as of July 1, 1912:

ENGINEERING AND CONSTRUCTION

COL. GEO. W. GOETHALS, *Chairman* and Chief Engineer, Culebra.

COL. H. F. HODGES, Assistant Chief Engineer, in charge of Lock and Dam construction, Culebra.

CIVIL ENGINEER H. H. ROUSSEAU, Assistant to the Chief Engineer, in charge of mechanical equipment and supervision of expenditures and estimates, Culebra.

LIEUT.-COL. D. D. GAILLARD, Engineer, Central Division, Empire.

LIEUT.-COL. WILLIAM L. SIBERT, Engineer, Atlantic Division, Gatun,

S. B. WILLIAMSON, Engineer, Pacific Division, Corozal,

A. L. ROBINSON, Superintendent, Mechanical Division, Gorgona.

ALL OTHER DEPARTMENTS

LIEUT.-COL. EUGENE T. WILSON, Subsistence Officer, Cristobal,

COL. C. A. DEVOL, Chief Quartermaster, Culebra,

GOETHALS

MR. MAURICE H. THATCHER, Head of Civil Administration, Ancon,

H. A. GUDGER, Chief Justice, Ancon,

FRANK FEUILLE, Counsel and Chief Attorney, Ancon,

COL. W. C. GORGAS, Chief Sanitary Officer, Ancon,

EDWARD J. WILLIAMS, Disbursing Officer, Empire,

H. A. A. SMITH, Examiner of Accounts, Empire,

MAJ. F. C. BOGGS, General Purchasing Officer, Washington, D. C.,

J. A. SMITH, Superintendent, Panama Railroad, Colon.

The headquarters of the division engineers and the department heads are in the towns nearest to the scenes of their activities. Beneath the higher officials are a host of assistants who exercise important supervisory functions, and then come the 35,000 employees.

How largely the Army and Navy have dominated the canal, since 1907, is shown by the foregoing organization, in which nine out of seventeen heads of departments are from the government forces. But this does not show the extent of this domination, because the full organization of subordinate officials shows twenty-two additional Army and Navy men in important positions.

The Pacific Division is the only one of the three grand divisions with a civilian engineer in charge, and there are no Army or Navy men in this division from top to bottom. The idea seems to have been to pit a civilian engineer against the Army men, who are in charge of the Atlantic and Central Divisions. The

THE AMERICANS IN PANAMA

Pacific Division, under Mr. Williamson, substantially demands the same engineering ability as the Atlantic Division under Lieut.-Col. Sibert, because each includes lock and dam construction and channel dredging. The cost-keeping accountant has shown where the civilian engineer has done his work more cheaply than the Army engineer, but the difference is accounted for in the physical obstacles that must be surmounted in the Atlantic Division, in obtaining sand and rock for the locks.

None of the complaints at government red tape which bristled all through the annual reports of Messrs. Stevens and Wallace may be noted in Col. Goethals' reports. The Army men on the canal might exclaim, with Brer Rabbit, that they were born and bred in the briar patch of red tape, and were just in their element when dropped into the Big Ditch. Col. Goethals looked ahead in making up his annual estimates of appropriations needed for the year in advance, and in making orders for equipment, materials and supplies, so that much of the vexation of the early years was avoided. Every head of a department must hand in an estimate of what will be needed to run him for the ensuing year and this plan keeps the canal ahead of its demands in all lines.

The equanimity with which Col. Goethals has met every unexpected development in the construction work is a distinguishing feature of the man's mental processes. If he ever has for one moment entertained the shadow of a doubt of the success of the lock-type canal, he has not allowed his fears to be manifested.

GOETHALS

The slides, the slip in the Gatun dam, the volcanic evidences in the Culebra cut, the cracks in the lock walls, earthquake disturbances, and a host of lesser troubles have not shaken his faith. One can hear employees and subordinate officials voicing all kinds of dark forebodings, but never the Chief Engineer.

The mammoth Gatun dam had been begun in 1906, and by 1908 was taking form under the constant dumping of rock and earth from the Culebra cut. On November 20, 1908, a toe of the great dam slipped, where the dam intersected the old French canal channel, carrying about 200 feet of the structure away. The hostile press, and those who had consistently opposed a dam at Gatun, immediately raised a storm of criticism against the stability of the proposed artificial mountain. The old wound, caused from the battle of the levels, was reopened and so violent was the outburst that President Roosevelt took a characteristic step to quiet the issue.

He asked President-elect Taft to go to the Isthmus, accompanied by Frederic P. Stearns, Arthur P. Davis, Henry A. Allen, James D. Schuyler, Isham Randolph, John R. Freeman and Allen Hazen, all eminent engineers, to make an investigation. The report made on February 16, 1909, completely vindicated the plan for a dam at Gatun with the statement that if any error had been made, it was on the side of precaution. They found the dam started along lines so excessively stable that they recommended that the height be cut from 135 feet above sea-level to 115 feet, which would still

THE AMERICANS IN PANAMA

leave the top of the dam thirty feet above the level of Gatun Lake.

An absolutely free hand always has been given to critics of the canal. Having nothing to conceal, and with firm faith in the technical soundness of the plans adopted, the government has had nothing it wished to keep from the light. Whenever criticism of any feature became especially severe, President Roosevelt promptly answered it by a full and scientific investigation with the inevitable result that the critics slunk into silence. Since President Taft has been in office the canal has been advanced to the point where the sceptical are cautious in criticism, and only some catastrophe of nature, in reasonable probability, can undo the achievement.

The six years from January 1, 1907, to January 1, 1913, constitute the main construction period of the Panama Canal. Col. Goethals has been Chief Engineer all but three months of that time. Steadily, foot by foot, the walls of the locks crept up and the bottom of the Culebra cut went down. By October, 1908, the preparatory work, substantially accomplished by Mr. Stevens, passed its highest point, and all energies were centered on the work of construction. Quarters, municipal work, road-making, subsistence and commissary were solved problems and the "No Help Wanted" sign was displayed, the labor problem, too, being substantially worked out. The chief business was to make the organization more efficient by anticipating needs of equipment and supplies, and keeping the morale of the workers to a keen edge through ab-

solute justice. Col. Gorgas had the health problem in hand.

Sixty-three steam shovels, in 1907, were increased to 100; the 284 locomotives were augmented to 315; cars of all kinds from 2,700 to 4,356; the mileage in the Canal Zone was increased from 185 to about 500 miles for the Panama Railroad and Commission tracks; the number of unloaders, bank spreaders, track shifters and pile drivers was increased from a third to three times the number left by Mr. Stevens; twenty dredges were put in service, 560 drills for blasting, fifty-seven cranes, twelve tow boats, eleven clapnets, seventy barges and lighters, fourteen launches, beside much other machinery and equipment not so noteworthy. The foregoing figures do not include the Panama Railroad equipment, which consists of seventy locomotives, 1,534 cars and coaches, and various other rolling stock common to a railroad. Practically all repairs and creative mechanical work was concentrated in the Gorgona and Empire shops, with capacities commensurate with the equipment. The Empire shop specialized on steam shovel repairs, but in July, 1912, the bulk of its work was consolidated with Gorgona. The date when the equipment reached a maximum is fixed by Col. Goethals as July 1, 1910. About 350,000 tons of coal and 500,000 barrels of oil have been used annually.

Dredging had progressed in the Pacific entrance to a point where five miles of the canal could be opened to navigation, on February 1, 1909. The *Newport* and *San Hose*, of the Pacific Mail Fleet, of American

THE AMERICANS IN PANAMA

register, were the first ships to go through. Considerable excavating was done in both entrances by steam shovels, the water being held out by dikes.

A striking instance of miscalculating the cost of one phase of canal construction is found in the estimate made by Prof. Burr, of the first Commission, which placed the cost of private lands that would be used in the Gatun Lake and elsewhere at \$18,656,000. As a matter of fact something more than \$300,000 has been spent in this way and \$500,000 is the maximum as estimated by Col. Goethals, in 1908. The area of the Gatun Lake crosses into the Republic of Panama on the West side of the canal, and the private property so condemned as well as in the Canal Zone is valued by a joint commission of Panamans and Americans.

Columbus had been honored by naming Colon and Cristobal for him at the Atlantic entrance of the canal, and an Executive order on April 30, 1909, honored the discoverer of the Pacific by changing the name of the Pacific terminal from La Boca to Balboa. It is at Balboa that the permanent machine shops, dry docks, yards, wharves, warehouses, and general equipment to cost \$20,000,000 will be located. Col. Goethals' conception of making the canal adequate for all the needs of shipping has a military utility that is not sufficiently recognized. By making it possible for vessels to coal at the canal, secure fresh provisions, get repairs made and expeditiously handle cargoes, the United States makes it unnecessary for any foreign power to establish a coaling station and similar facilities.



Photos, 1, Harris & Ewing, Washington, D. C.; 2, 4, 5, Clinedinst, Washington, D. C.; 3, Pictorial News Assn.

1. LIEUT.-COL. H. F. HODGES. 2. H. H. ROUSSEAU, U. S. N.
3. S. B. WILLIAMSON WITH PRESIDENT TAFT. 4. LIEUT.-COL.
D. D. GAILLARD. 5. LIEUT. COL. WILLIAM I. SIEBERT.

GOETHALS

ties in this hemisphere, on the pretext of caring for its merchant marine. With ice plant, cold storage, bakery and other subsistence and commissary facilities already established, it will be easy for the government to institute the practices mentioned at Balboa coincidental with the opening of the canal. Col. Goethals has been working toward that end for years and the bill passed in the 1912 Congress approves his ideas.

In 1909, Col. Goethals seems to have had the idea of making the Canal Zone habitable, for an extensive scheme of road-making was begun, and \$75,000 was spent in a survey of the Canal Zone. The survey never was finished, and since then Col. Goethals changed his views, in favor of making the Canal Zone a military reservation, the part not in use to be left to the jungle and only canal employees allowed, without special permission, in the ten-mile limits. Critics in the United States displayed their ignorance by protesting that the land in the Canal Zone should be opened to settlement, like our western lands. The canal occupies 96 square miles of the 436 in the Canal Zone and 73 square miles are privately owned. There is very little of what is left that Americans would occupy. It is in the main mountainous, and without a system of roads that would be prohibitive in cost, would not be accessible in the rainy season. Col. Goethals disposes of the idea of settlement in his usual terse way when he says: "The inducements offered by farm lands in the Canal Zone are not likely to attract Americans. Other occupants are not desirable."

The Americans have made an investment at Panama

THE AMERICANS IN PANAMA

which should be guarded from every possible danger. In times of war everybody in the Canal Zone, of course, would be subjected to scrutiny and possibly to ejection. It will, therefore, save trouble and expense to begin, right at the start, to treat it as a military reservation is treated in the United States. The expense of sanitation and civil government would be too great to make settlement profitable.

Work on the fortifications was begun in 1911, on Flamenco Island, three miles out in the bay at the Pacific entrance, and on Toro Point at the Atlantic entrance. The estimate for their cost, as fixed by the officers appointed to design them, is \$12,475,328, and Congress, in March, 1911, appropriated \$3,000,000 of that amount. The latest and largest disappearing rifles will be installed after the concrete work is finished. The locks at the Pacific end are nearly ten miles from the fortifications, which insures them against bombardment by an enemy's ships, and the Atlantic locks are seven miles from the fortifications. Some form of defense from airships must be worked out.

It would be just as logical to say that New York should remove its traffic policemen from Thirty-fourth Street and Broadway, as to argue that the United States should not fortify the canal. The policemen are there to aid traffic by enforcing the rules which make order possible, and fortifications are necessary at Panama to insure that no nation, whether fighting the United States or some other nation, shall disable a world transit route. Neutrality would be a myth without a strong police power at Panama. It is to

the interest of every nation that the canal be so policed and fortified that commerce could not be disrupted through the deliberate, or unintentional, actions of belligerent nations. Warships of all nations may pass through the canal, but if of nations engaged in war, they cannot linger at either end of the canal after or before passage.

When the canal is completed, the beautiful towns along the route will be abandoned. Gorgona, Bas Obispo, Las Cascadas, Empire, Culebra, and Paraiso will be razed. A permanent camp for the Army will be located on the East side of the canal, across the Cut from the town of Culebra. Marines have been in the Canal Zone since 1904, and in 1911 the Tenth Infantry was added to the permanent garrison, which will be further augmented by several regiments. The soldiers will police the Canal Zone after construction work is finished. Balboa and Cristobal will be the principal cities, though at Gatun and Pedro Miguel forces to operate the locks will be housed.

President Taft signed, on August 24, 1912, a bill for the permanent government and operation of the canal. Col. Goethals' ideas were followed almost to the letter in drawing this bill. The President is authorized, as soon as the canal is sufficiently near completion, to abolish the present Commission and to appoint a Governor, for a term of four years, at a salary of \$10,000 per annum. In time of war, the President may substitute an Army officer for this Governor. Salaries and wages are not to be more than twenty-five per cent greater than in the United States, and

THE AMERICANS IN PANAMA

many of the perquisites now enjoyed by the employees are to be eliminated. The Canal Zone will be open to only such persons as the Governor may admit; American coast-wise ships are exempted from paying tolls for passage; foreign-built ships owned by Americans may register under the American flag; ships owned by railroads cannot pass through the canal; the Interstate Commerce Commission is given power to determine questions of competition; and the present judiciary system is continued with right of appeal to the Federal courts in the United States. In addition, the government may sell ships supplies and coal and provide facilities for repairing vessels at the canal terminals.

At the close of the fiscal year ended June 30, 1912, Col. Goethals could look forward to one year more of the arduous labor and heavy responsibility he has borne, before the big job would be in the clear. Invoicing conditions at that date, we find that the great Gatun dam was more than 90 per cent completed; the concrete work in the locks and spillway was about 90 per cent completed; the Culebra cut was approximately 90 per cent completed; the relocated Panama Railroad was finished, and the work of establishing permanent shipping facilities at Balboa and Cristobal was under way.

Owing to fresh slides in the Culebra cut, and to changes in plans in the Pacific division, a new estimate of the total excavation for the completed canal and accessory plant became necessary at the beginning of the last complete fiscal year of canal construction—July 1, 1912, to June 30, 1913. The revised estimate

GOETHALS

then placed the excavation at 212,227,000 cubic yards, of which amount 175,901,052 cubic yards had been removed at the end of July, 1912, leaving to be excavated for the completed canal, 36,325,948 cubic yards. The latest estimate, however, raises the total excavation to 221,000,000 yards. The canal organization cannot remove the uncompleted portion before the first ship is scheduled to pass through the canal, in September, 1913, but of the 47,000,000 yards left, more than 8,000,000 yards are to be excavated outside of the canal proper, or in the sites for the coaling station, dry docks and terminal at Balboa, so that the actual canal channel substantially will be finished before the passage of the first ship.

The Atlantic division in July, 1912, lacked 8,009,778 yards of completion; the Central division, including the Culebra cut, lacked 10,678,953 yards; and the Pacific division, 17,637,217 yards—a grand total for the whole canal of 36,325,948. The ancient trouble, slides, prevented the completion of the Culebra cut in 1912.

During the early part of 1912, the Gatun Lake was stationary at about 17 feet, but with the beginning of the rainy season in May it began to rise, and the plan was to hold the lake, by use of the spillway, at a head of water of 50 feet until the beginning of the rainy season in 1913, when it will be allowed to raise to 80 feet, and this would back the water up, by September, 1913, to a depth through the Culebra cut to permit the passage of some kind of a ship. The ultimate level of the lake will be 85 feet.

THE AMERICANS IN PANAMA

There have been many estimates of Col. Goethals in the magazines and newspapers and in books. They all pay tribute to him as an administrator without a superior. Some writers have been so impressed by the man that they rate him a larger fact than the canal itself. Yet it is possible to gauge the man without overshooting the mark in that fashion. Congress gave him a credit of \$290,000,000 and allowed his estimates of annual expenditures. He has missed the worries of a private contractor who has to consider the financial ways and means of his operations, and besides, the dissatisfaction of employees have been stifled by an unparalleled standard of pay and by gratuities that make nearly every position in the Canal Zone in the nature of a sinecure. Contentedness has been bought by pouring millions of dollars into creating not merely comfortable, but even luxurious conditions of living for the employees.

No private enterprise could succeed for a moment on such a basis. On its economic side, the canal proves nothing because any competent organization could bring things to pass if only enough money is forthcoming, as has been the case under the government in Panama. An admirable job has been done in Panama, but it has not been economically done, in the usual understanding of that word. Nobody set out to do it economically. Every leak has been plastered with a dollar. At no point does the canal project affect a complete economic operation. Money is being spent but it is not being made. The work is being done without regard to its ever paying.

Socialists, therefore, should be cautious in holding up the canal as an example of their theories in successful practice. Industrial life, even under Socialism, would have to do what the canal project has not done and is not required to do, namely, justify itself as a business proposition. The canal ultimately may do this, but it will not be because it was designed and constructed with that imperative end in view. Even the commissary and subsistence operations that usually evoke strong approval as evidences of governmental efficiency, possess no socialistic and slight communal aspects. The government has made them pay by arbitrarily exacting a profit under noncompetitive conditions. None of the forces of industrial life that tend to make for favorable or unfavorable economic conditions, can operate in a government job which secures its capital, not because of the intrinsic merit of the enterprise, but through the gratuitous function of taxation.

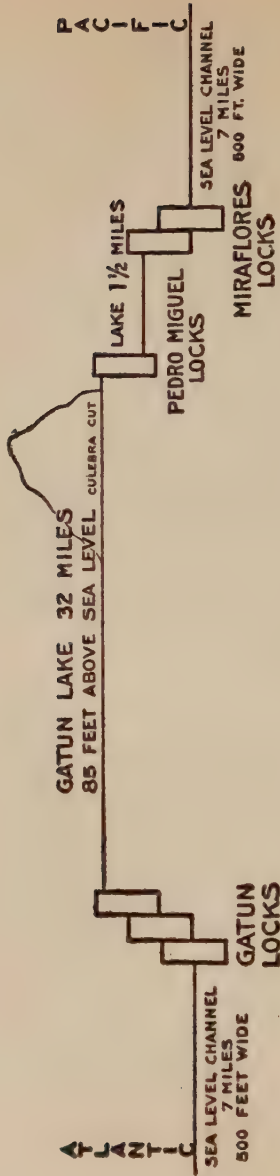
If we turn to the purely technical side of the project, unquestionably the highest praise is due to the Army engineers. On its engineering side, the canal proves that the government does not have to go outside its own forces to find the highest order of ability. The American people never again will clamor for private initiative and execution of any enterprise they may want accomplished.

Col. Goethals is indeed a great administrator. Even if the employees have had soft conditions of employment, it is an achievement to impress 35,000 men with a faith both in your capacity as an engineer and your

sense of justice. This writer knows of no higher tribute that can be paid to him than the statement that in five months in the Canal Zone he never heard anyone speak slurringly of the Chief Engineer. Col. Goethals has been no respecter of persons. In 1912, two officials drawing \$300 a month salary each, were discharged as summarily as any common laborer would have been, for breaches of the rules. It has been his practice to give his Sunday mornings to hearing grievances from employees, and those without just grounds of complaint are sent about their business peremptorily, while those who have been wronged are given justice, no matter how high the official who is in error. The man's admirable poise is shown in the just way he has exercised the absolute power of a Czar, for when he sets his pen to paper a new law is made in the Canal Zone. Those who cannot square their conduct with his fiat, go out on the next steamer, whether an individual or a labor union *en masse*.

As Admiral Schley said of the controversy over the battle of Santiago, "there is honor enough for us all," so with regard to the Panama Canal. Col. Goethals, as the star of the last six years, gets the curtain calls, but even if we assign Messrs. Stevens and Wallace to the rôles of villains, they, too, did their parts well. And the whole company of Americans, composing the chorus or supernumeraries, have contributed vitally to the success of the play. After all, it is no one man, but the Spirit of Americanism, indomitable and triumphant, that we admire in Panama. Future generations will see in Col. Goethals the outward head

of this national characteristic, but the final verdict of approval will be much broader and more just than that, even to the admission that all praise belongs to the Americans in Panama.



PROFILE MAP OF THE PANAMA CANAL.

CHAPTER XIV

LOCKS AND DAMS

AN elevator system for ships is being installed at Panama at a cost of \$58,000,000. These elevators, known as locks, will raise ships to and lower them from the great artificial, inland lake which is 85 feet above sea-level.

In a sea-level canal, such as Suez, ships steam through a dug-out channel from one ocean to another. But at Panama, the plan adopted involves the lifting of ships over the Isthmus and the locks are the means whereby they are lifted. For this physical operation there are six locks on the Atlantic side and six on the Pacific side, at each end of the Gatun Lake.

A ship arriving at Colon from New York, on its way to San Francisco, enters the sea-level channel in Limon Bay and steams for seven miles through the canal, which is 500 feet wide and 41 feet deep, to Gatun. Here its way is barred by a massive pile of masonry with impressive steel gates and towering 85 feet above the ship is the surface of the Gatun Lake. To the West of the ship runs the man-made mountain, the Gatun dam, which holds the lake in bounds. The problem is to lift the ship to this lake.

As if by magic, the gates swing open and an electric locomotive, which has run out on a guide wall and fastened to the ship, tows it into the first lock. The

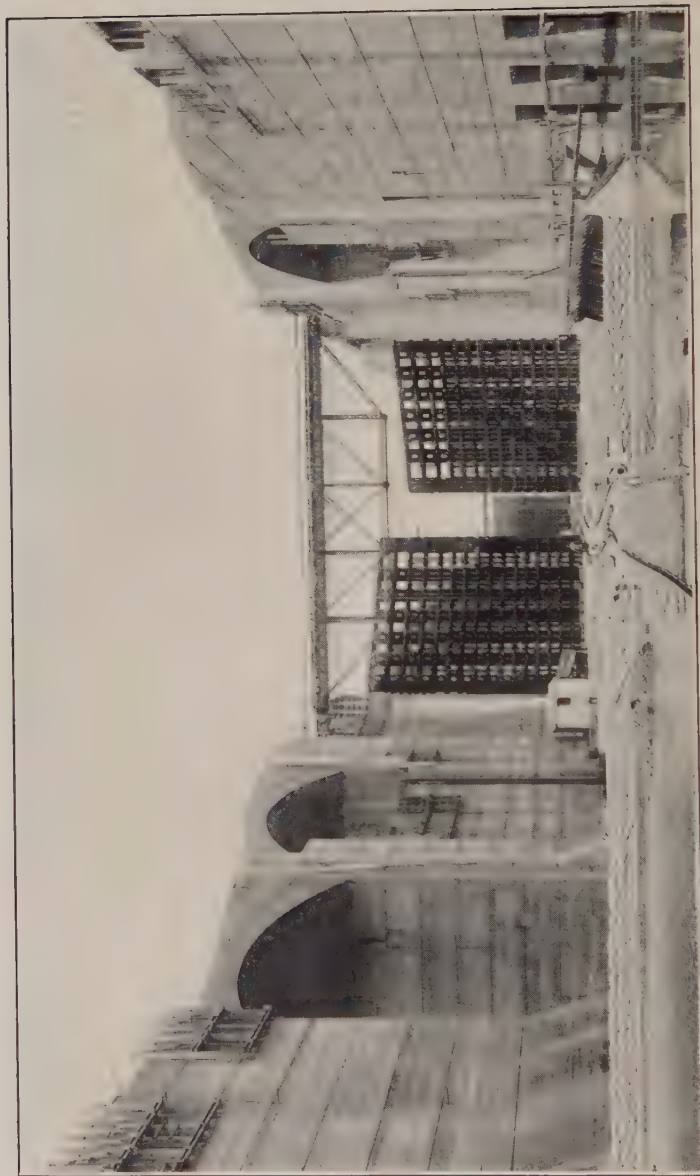
THE AMERICANS IN PANAMA

gates swing together and the ship is imprisoned in a chamber 1,000 feet long and 110 feet wide and built of concrete. In a moment the water in this chamber begins to rise, being supplied through holes in the bottom, and the ship rises with the water.

Fifteen minutes after entering the lock, the ship has risen with the water for $27\frac{1}{2}$ feet. If the full capacity for filling the lock should be used the ship would rise that height in eight minutes. Another set of gates swing open in front of the ship, and the locomotives tow it into the second lock, a concrete chamber of the same dimensions. The gates having closed behind, this chamber begins filling with water until the ship is raised again for $27\frac{1}{2}$ feet. A third set of gates open and the ship is towed into the final lock where the operation is repeated with a raise of 30 feet, or a total lift for the three locks of 85 feet. When the gates in front swing open the ship steams out into the Gatun Lake. The time spent in climbing 85 feet was an hour and a half.

For sixteen miles through this lake the ship steams in a channel 1,000 feet wide; for four miles in a channel 800 feet wide, and for three miles in a channel 500 feet wide, or twenty-three miles in all. Then it enters the famous Culebra cut, which is 300 feet wide through the continental mountain divide, and nine miles long. At the end of the Cut is the Pedro Miguel lock, thirty-two miles from Gatun.

After entering this lock, which essentially is the same as the ones on the Atlantic side, the ship goes through the reverse of the process at Gatun. The



Photograph, Underwood & Underwood, N. Y.

ENTRANCE TO A LOCK—GATES UNDER CONSTRUCTION.

LOCKS AND DAMS

water in the concrete chamber begins falling, taking the ship down with it. When it has fallen 30 feet the gates in front open and the ship goes out into another artificial lake, a mile and a half long, at the end of which are the Miraflores locks. These two locks lower the ship $27\frac{1}{2}$ feet each, or a total for the three locks of 85 feet, which was the height the ship was raised on the other side. The ship then steams through a sea-level channel for seven miles to the Pacific, having made the whole journey from deep water in the Atlantic to deep water in the Pacific, fifty miles, in ten hours.

Thus it will be seen that the Atlantic and Pacific oceans are still separated by thirty-two miles of land at Panama, on which is a fresh-water lake 85 feet above sea-level. The locks simply are so many stair-steps up to and down from this lake. At both ends the locks are built in pairs, or twins, so that ships going in opposite directions may pass through them simultaneously. A wall 60 feet thick separates the locks, and if one set should become disabled, the adjoining set still would be available for passage. The time required for a ship to mount the three locks on one side and descend the three locks on the other side is three hours.

On the Atlantic side, the locks at Gatun are connected and constitute one solid piece of masonry. On the Pacific side the lock at Pedro Miguel is separated from two locks at Miraflores by a small lake a mile and a half long. This lake, like the great Gatun Lake, is formed by damming rivers. A dam at the Pedro

THE AMERICANS IN PANAMA

Miguel lock, which is the first lock encountered going toward the Pacific, holds the waters of Gatun Lake from spilling down the Pacific slope.

Chief Engineer Stevens began the excavations in the Gatun and Pedro Miguel lock sites in 1906, shortly after the decision was made for a lock-type canal, but most of the excavation and all of the concrete laying has been done under Col. Goethals. It was necessary to remove about 5,000,000 cubic yards of rock and earth from the site of the three locks at Gatun to prepare a foundation for the tremendously heavy structure. Careful borings had been made to ascertain if a suitable foundation could be found there.

On August 24, 1909, the first concrete was laid in the Gatun lock site. Rock of a desirable kind for use in making the concrete, as well as sand, could not be found in the Canal Zone, and experiments along the coast showed that at Porto Bello, twenty miles East of Colon, good rock could be quarried, and sand was discovered in suitable quantities and quality at Nombre de Dios, forty miles East of Colon. These two places are the oldest on the Isthmus, Columbus having been there in 1502.

Rock crushing began at Porto Bello on March 2, 1909. If all the rock and sand removed from Porto Bello and Nombre de Dios was placed in barges separated by the usual distances in a tow, they would reach from Colon to New Orleans, or 1,500 miles. This material was towed to Colon and thence through the old French canal to Gatun. Here it was unloaded

LOCKS AND DAMS

by machinery and stored conveniently for the concrete mixing plant.

All the machinery and equipment for building the locks was designed on a scale commensurate with the unprecedented size of the structures. Eight giant mixers were fed with rock, sand, and cement by cars operated by electricity, the finished product coming from each of the mixers at the rate of 64 cubic feet for each complete operation.

To get the concrete into place, four cableways, suspended across the lock site on towers 85 feet high, were installed. Electrically operated cars brought the concrete to these towers where great buckets were filled. These buckets then were run up to the cables, and out on the cables to a given point, where they were lowered and the concrete dumped into the proper position.

After the floors of the locks had been laid, the walls were built in the usual manner of erecting steel forms, which were removed when the concrete had hardened. At Gatun the walls of the locks were built in sections 36 feet long, and joined together, on the idea that such construction would have less tendency to settle and crack than if it was built in one solid, continuous wall. This may be appreciated when it is understood that at Gatun the locks form a concrete wall about 3,500 feet long, or considerably more than half a mile. The usable part of each lock is 1,000 feet long and there are three in flight. The twin locks have an outside wall 52 feet wide, an inside measurement 110 feet wide, a separating wall 60 feet wide, another inside

THE AMERICANS IN PANAMA

measurement of 110 feet, and a final outside wall 52 feet wide, or a total width for both locks lying side by side, from outer wall to outer wall, of 384 feet.

In each of the outside walls and in the center wall tunnels 18 feet in diameter were constructed for use in filling and emptying the locks with water during the processes of raising and lowering ships. Smaller tunnels run out from these main longitudinal tunnels, under the floors of the locks with openings through which the water is turned into or withdrawn from the lock chambers by gravitation. Valves operated by electricity regulate the flow of the water. The water for operating the locks starts from the Gatun Lake and flows through the tunnels downgrade, through the three locks, until it finally is used in the lowest lock when it is spilled into the sea-level channel.

The first concrete for the Pacific side locks was laid at Pedro Miguel on September 1, 1909, seven days after the beginning of operations at Gatun. It was in February, 1910, that concrete work was started in the two locks at Miraflores, which, in 1912, were the most backward feature of canal construction. For all twelve locks, 4,302,563 cubic yards of concrete is required. Three years after beginning the concrete work, or in August, 1912, the locks were more than 90 per cent completed, the one at Pedro Miguel being the nearest done with 98 per cent of the estimated concrete in place. The three locks at Gatun then had about 95 per cent in place and the two at Miraflores about 80 per cent.

For the three locks at Gatun, 2,000,000 cubic yards

LOCKS AND DAMS

of concrete was required; for the one lock at Pedro Miguel, 889,827 cubic yards; and for the two locks at Miraflores, 1,412,736 cubic yards. A contract was awarded the Atlas Portland Cement Co. for 4,500,000 barrels of cement, with the privilege of increasing this order by 15 per cent, and in 1912 another 1,000,000 barrels were bought to complete the canal. The stability of the locks depends upon the quality of cement used, hence the Government inspectors have watched this factor jealously.

Rock for the Pacific locks has been obtained at a quarry opened in Ancon hill, at the Pacific entrance of the canal. The sand has been brought from Chame, about 23 miles up the coast from Panama. The Pacific division has been at much less expense in obtaining materials than the Atlantic division, accounting for the difference in the cost of construction in the two divisions. The Pacific division was at one disadvantage in that the three locks were not together, as on the Atlantic side, necessitating practically two separate jobs. The amount of excavation at Pedro Miguel to secure a foundation was 770,000 cubic yards and at Miraflores, 2,247,600 cubic yards, a total for the three locks of 3,017,600 yards, which is nearly 2,000,000 yards less than had to be excavated in the site of the three Atlantic locks.

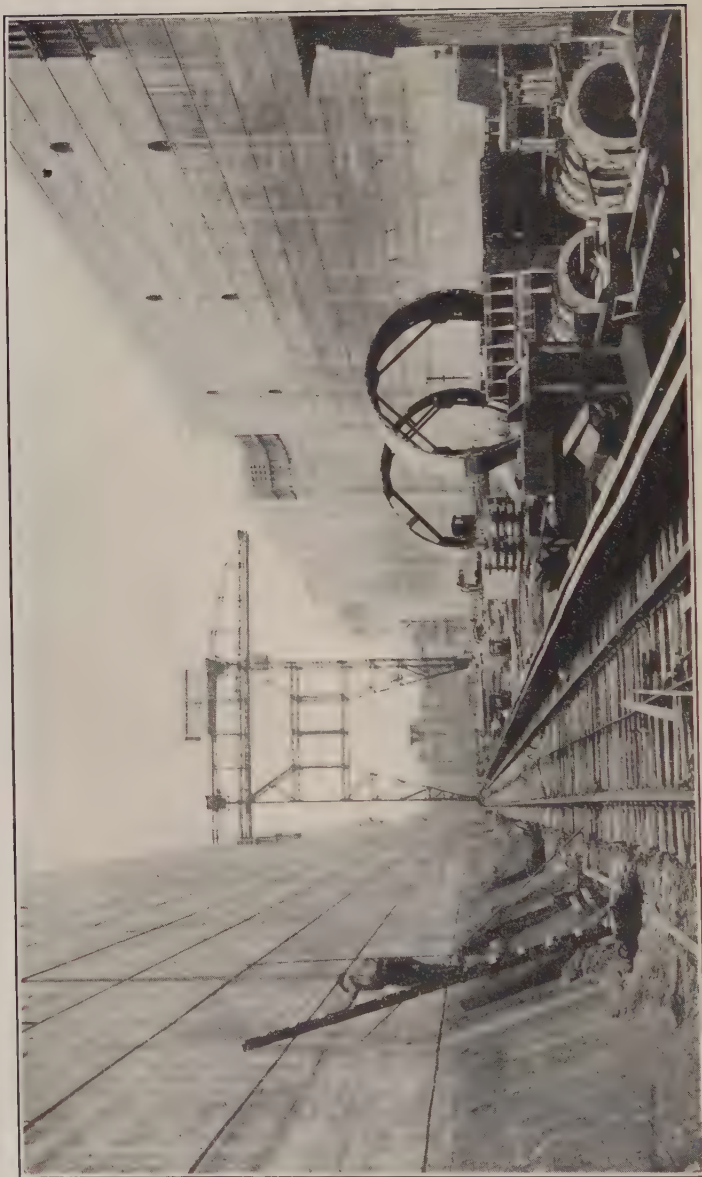
All twelve locks were half done as regards the concrete work, about May 1, 1911. The best month's record for laying concrete was made in April, 1912, in the Pacific division, when 97,735 cubic yards were laid. The concrete is all of reënforced construc-

THE AMERICANS IN PANAMA

tion, and an unusual feature has been the placing of rocks weighing many tons throughout the walls. The lock walls at Pedro Miguel were not built in sections as at Gatun, but as one solid piece of masonry more than 1,000 feet long. At Miraflores the two locks were built in sections, as at Gatun.

The gates for the locks were contracted for, in 1910, to cost \$5,374,474.82. Their construction and erection are by the McClintic-Marshall Construction Company, of Pittsburgh, under the inspection of the Commission. This concern, in 1912, had more than 1,000 men at work and were rushing the construction to meet the dates agreed upon for their completion. Under the contract this company had until January 1, 1914, to finish the work, but estimated that this time could be beaten by six months. The date for finishing the gates at Pedro Miguel lock was May 1, 1912, but the contractor was behind on this program; at Gatun the gates were to be erected by February 1, 1913; and at Miraflores by June 1, 1913. Work was rushed on the gates at the lake end of the Gatun locks, in the summer of 1912, to hold out the rising water. On July 1, 1912, out of a total of 58,000 tons of steel required in all the gates, 19,631 tons had been erected, or 34 per cent, leaving to be erected before September, 1913, when the first ship is scheduled to go through, 38,369 tons.

There are 46 gates in all twelve locks, with two leaves to the gate, or 92 leaves. The gates are from 47 to 79 feet high, are 7 feet thick, and weigh from 300 to 600 tons each leaf. They are constructed with



Photograph, Underwood & Underwood, N. Y.

INTERIOR OF A LOCK—CAPACITY, TWO SHIPS AN HOUR.

LOCKS AND DAMS

interior cells, which at the bottom will be air chambers to assist in their manipulation, and at the top, water chambers, to increase their weight as the water rises in the locks. The sheathing is with steel plates riveted on heavy girders. These gates will be opened and shut, to permit the entrance or egress of ships, by electrical apparatus.

As 95 per cent of the vessels in the world are less than 600 feet long, it would be a great waste of water and time to use the full 1,000-foot lock in each passage. So intermediate gates are being constructed which will permit the use of only 400 or 600 feet as the particular vessel may require. There are recesses in the lock walls which allow the gates to be opened and still leave a clear width of 110 feet. At the entrance of the locks, a chain, with links three inches in diameter, stretches from one side to the other to stop vessels which might not obey the signals. In case the first gates should be rammed and broken, a second set of gates especially provided for emergencies have been constructed behind the first set. If both sets of gates should be demolished, the water would rush through with a fearful velocity, but provision has been made against this contingency by having in readiness emergency dams, which would be swung out over the lock and forced down through the in-rushing water. This dam, built of steel, is open at the bottom and steel plates are then shoved down it, gradually closing the openings until the flow is stopped. A floating caisson would then be placed in position and sunk, completely shutting out water from

THE AMERICANS IN PANAMA

the lock, the emergency dam would be raised, and repairs begun.

It is to prevent such accidents that the plan of towing vessels through the locks with electric locomotives was adopted, as then no misunderstanding of signals from the captain to the engineer of a ship could result. The tracks for these locomotives are on each side wall of the locks, and two will fasten to the rear and two to the front of a ship to effect a passage. If all twelve locks were joined end to end they would make a canyon nearly three miles long, 110 feet wide and 80 feet deep.

THE GATUN DAM

The natural topography of the Isthmus at Panama permitted the Chagres River to escape into the Caribbean Sea through a break in the mountains at Gatun. Engineers logically considered that this was the point at which a dam should be thrown across the Chagres River. Two valleys were formed at Gatun by a hill which rose in the center to an elevation of 110 feet, and the dam that was designed runs from the Gatun locks to this hill and from this hill to the mountains, a total distance of 7,500 feet, or a mile and a half.

As the Chagres River every year discharges enough water to fill the lake, some means of disposing of the surplus water had to be provided. The plan adopted called for a spillway to be constructed in this hill, about third-way in the dam site. This spillway is of concrete, requiring 225,000 cubic yards to complete.

LOCKS AND DAMS

On July 1, 1912, it was more than 90 per cent completed.

The floor of the spillway is 10 feet above sea-level, and 300 feet wide through the hill, which involved excavation through rock for a depth of 100 feet at the highest point of the hill. A concrete dam was built on this floor to a height of 69 feet above sea-level and in shape like a semicircle. On top of the concrete dam, piers were built with an arrangement for steel gates. These steel gates will be electrically operated and regulate the flow of water out of the lake. As much as 140,000 cubic feet of water per second may escape through the spillway when the gates are open.

There will not be a complete loss of this water, as on the east side of the spillway a power plant of the hydro-electric type will be operated. A drop of 75 feet by the water will operate turbine engines which in turn will operate the electric machinery that will generate all the power and illuminating current needed from one end of the canal to the other. But an additional power plant will be maintained at Miraflores for emergencies. The power to operate the lock gates will come from the spillway plant.

The Gatun dam is so stupendous that it almost seems to be a continuation of the hills that enclose the lake. It in fact does complete the natural mountain chains that form the barriers of the Chagres River. It is 105 feet high, or 20 feet above the ordinary level of the lake at 85 feet elevation. The plan of construction has been to build parallel mounds, for the mile and a half, 1,200 feet apart. Between

THE AMERICANS IN PANAMA

these mounds, built of rock and earth, a core for the dam has been constructed by pumping mud and sand from the bed of the Chagres River. About 20 per cent of the material pumped is solid matter, and when it has deposited the water is pumped off. This operation has been repeated until an impervious heart has been made in the dam. Even if water from the lake penetrated the outside walls of rock and earth, it would find this core water-tight. The dam is nearly half a mile thick at the base, 398 feet thick where the water surface strikes it at 85 feet, and is 100 feet wide at the top. The outer coverings of rock and earth on the dam close over the hydraulic core at the crest. For about 500 feet the dam will be subjected to the full pressure of 85 feet of water, at other points to a less severe pressure.

Engineers consider the dam excessively safe and the layman has no difficulty in appreciating its strength. This feature was subjected to a storm of criticism throughout the early days of the canal because some engineers believed the earth would not support so heavy a structure, but the present Chief Engineer never has doubted its stability. About half of the material required, 21,994,111 cubic yards, has been brought from the Culebra cut. On July 1, 1912, the dam was more than 90 per cent completed, leaving less than 10 per cent to be done before the passage of the first ship.

On the Pacific side, the first dam encountered is at Pedro Miguel and serves to hold the waters of Gatun Lake at its southern end. It is 1,400 feet long and

LOCKS AND DAMS

forty feet wide at the top. The maximum height of the water against this dam will be 40 feet. The plan of construction is much the same as at Gatun, but only about 1,000,000 cubic yards will be required.

After a ship is lowered 30 feet by the Pedro Miguel lock, it finds itself in an artificial lake a mile and a half long. This lake is formed by two dams, the one to the west being 2,300 feet long, and 40 feet wide at the top, holding a maximum head of water of 40 feet. It is constructed with a hydraulic core like the Gatun dam. On the east a concrete dam 500 feet long, and provided with a spillway, as at Gatun, and capable of discharging 7,500 cubic feet of water per second, will hold the small lake in control. The Cocoli River is the principal feeder of this lake.

Records kept by the French, and by the Americans since 1904, show conclusively that enough water always will be available to keep the Gatun Lake and the tiny Miraflores Lake adequately supplied with water. No trouble at all can develop during the eight months of rainy season, and in the dry season of four months enough water will have been stored in the lake by means of the regulating works in the Gatun dam spillway to allow for all losses through evaporation, seepage, power consumption, and loss through the locks. During the wet season the lake will be raised from elevation 85 for two feet, to elevation 87, over an area of 164 square miles. This water could be used until the lake falls to about 82 feet, or five feet over the 164 square miles. In an average dry season this would permit 58 complete transits of the canal

THE AMERICANS IN PANAMA

every 24 hours, if the full 1,000-foot capacity of the locks is used, or more than the period would allow if vessels followed at intervals of one hour.

The Gatun Lake is backed up among the hills by the dam until it reaches a width of more than twenty miles at the widest point, and a length between Gatun and Pedro Miguel of thirty-two miles. It will be broken by many small islands, and stretches of high lands, and is narrowest in the Culebra cut where for nine miles the width is 300 feet. From Gatun to the entrance of the Cut, a distance of twenty-three miles, lighthouses are stationed at commanding points to guide ships at night. The channel throughout is at an average depth of 45 feet. In order to raise the relocated Panama Railroad above the level of the lake it was necessary to make fills to the extent of 16,425,292 cubic yards.

The Navy Department has selected a site near San Pablo, about twenty miles inland from the Atlantic, and on the East side of Gatun Lake, for a high power wireless station. It is to be at an elevation of 110 feet above the level of the lake and capable of sending a message for 3,000 miles, to Washington, D. C., or to a similar station on the California coast. Smaller stations will be maintained at Colon and Balboa in the Canal Zone, and at Porto Bello. The Republic of Panama and private companies will not operate stations in competition with the American government.

If the great Gatun dam should break, the water in the lake might sweep devastatingly over the city of

LOCKS AND DAMS

Colon, seven miles away, or pass through the old bed of the Chagres River harmlessly into the Caribbean Sea. While the pressure on the dam will be terrific, no such catastrophe is considered probable.

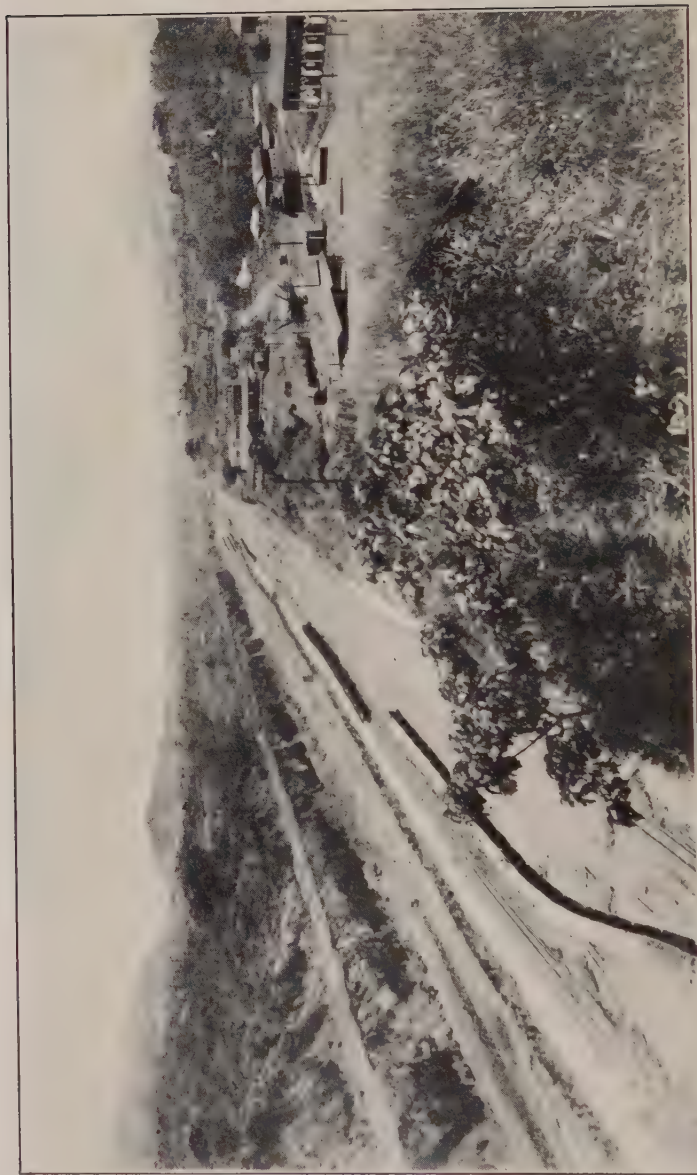
CHAPTER XV

THE CULEBRA CUT

POPULAR interest always has centered chiefly in the excavation phase of canal construction, losing sight of the fact that the locks, dams, and breakwaters call for an expenditure of \$85,643,000. The Culebra cut has been exploited more than any other feature of the canal, yet it was estimated to cost \$80,481,000, or five million dollars less than the features just enumerated. Even the dredging of fifteen miles of sea-level channel has received little publicity, and this was to cost no less than \$30,906,000.

The physical aspects of the dry excavation doubtless account for this singling out of one feature by the public mind. However stupendous the laying of concrete might be in the locks, or the sucking up of mud by the dredges, they are not as impressive as cutting through a mountain chain. They are prosaic operations compared with the picturesque attempt to change geological conditions. In the Culebra cut, Man was wrestling with Nature, whereas, in lock-building, he merely is playing the rôle of mason.

One finds in government work that the chief aim seems to be to plant two employees where only one worked before, and the canal organization is the least overworked set of employees in the world, but in the excavation phase of the government work the organ-



Photograph, Underwood & Underwood, N. Y.

THE CULEBRA CUT, LOOKING TOWARD THE PACIFIC.

THE CULEBRA CUT

ization has attained as great efficiency as any private contractor could have attained, under the conditions adopted in the Canal Zone. World records for steam shovel performances have been broken by government employees in Panama under adverse circumstances.

The Culebra cut is nine miles long with a curve for nearly every mile. At these curves, the cut is widened to permit the ships to pass easily. Always the chief problem has been one of transportation, or how to keep empty cars in front of the steam shovels constantly, in a canyon only three hundred feet wide. In a working day of eight hours it has been found possible to keep the steam shovels working only about six hours, because of this circumscribed field of operations.

Naturally the 75 miles of track in the Culebra cut must be shifted constantly as the excavation work carries the levels down. This keeps the track shifters and hundreds of men at work day and night. During the maximum operations in the Cut, 6,000 men were employed in the daytime, while at night 400 men worked to keep the steam shovels in repair, to replenish their coal bins, blast more material for the shovels, and otherwise to get the Cut in shape for the next day's activities.

About 100,000,000 cubic yards were to be removed to complete this part of the canal, or practically half the total excavation. On July 1, 1912, the beginning of the last year of work, there were 7,399,615 yards left to be removed, which would have been out by January 1, 1913, at the rate of excavation, if it had

THE AMERICANS IN PANAMA

not been for the slides. To this had to be added 6,000,000 yards from that source, or more than 14,000,000 yards to be removed in order to get the Cut in shape for the passage of the first ship. It was decided then to keep the 38 steam shovels at work and operations at full blast until July, 1913.

For the whole length of the Cut, the average depth from the surface to the proposed bottom of the canal was about 120 feet, the highest point on the center line of the canal being at Culebra between Gold and Contractor's hills where excavation has gone down 272 feet. After the soil had been removed for a short depth, solid rock was struck and to January 1, 1913, 54,504,150 pounds of dynamite were used in blasting, or the staggering total of 27,252 tons. The lay mind thinks of a pound of dynamite as impressive, but its use in the canal work has been bewilderingly heavy.

The following table shows the amount of dynamite used for the nine years of American operations:

1904 and 1905	500,000 lbs.
1906	1,400,000 "
1907	5,087,000 "
1908	6,822,000 "
1909	8,270,000 "
1910	10,403,000 "
1911	9,501,850 "
1912	8,533,000 "
1913	3,986,500 "

THE CULEBRA CUT

Most of the explosive has been used in the Culebra cut. It is estimated that a pound of dynamite will break up 2.14 cubic yards of rock and earth, and as much as 26 tons has been set off in one blast in the canal. Stringent rules have prevailed to prevent accidents, and while deaths from this cause have run into the hundreds the handling of this amount of dynamite has been distinguished for the small number of fatalities. In September, 1908, a steam shovel dug up a bushel of dynamite left by the French in 1887, but it had lost its potency. The largest single shipment of dynamite to Panama was 846 tons received on June 27, 1911, without an accident in loading or unloading from the steamer.

All through the day drills, operated by compressed air, are boring into the rock in the Cut for 24 feet. A small charge of powder is set off at the bottom of these holes to enlarge them for the real charge of as much as 200 pounds. Then after the men have quit for the noon hour, or after five o'clock in the afternoon, the charges are set off by electric current. It sounds like the steady booming of artillery in the Cut. Many persons have been killed by being struck by rocks hurled long distances in these blasts. The next morning the steam shovels find plenty of food for their hungry jaws, which bite off four or five cubic yards at a dip, swing around and drop the six or seven tons upon the cars. Frequently they lift rocks so heavy that the cars are broken.

From 150 to 175 trains a day loaded with excavated materials leave the Culebra cut for the dumps.

THE AMERICANS IN PANAMA

A great deal has gone to build the mighty Gatun dam; much has been used in reclaiming nearly 400 acres from the ocean at Balboa, the Pacific terminal; the new Panama Railroad has required millions of yards in making fills; and the breakwater at Balboa also has taken a considerable amount. What could not be usefully employed has been wasted on dumps. The average haul from the Cut has been twelve miles, but as much as thirty miles must be traveled by some of the dirt trains. Twenty flat cars constitute a train and one car can be loaded by a shovel in two and a half minutes, or with seven scoopsful of earth and rock. When the trains get to the dumps, an unloading plow is drawn by a steel cable over the flat cars, sweeping the material off the side which is open. Then spreaders are pushed over the track to shove the material to one side and down the embankment. Track shifters later come along and move the track over to the edge of the fill. Between 1,000,000 and 1,500,000 yards have gone out of the Culebra cut every month, except one, since December, 1907.

The employees are carried from the various towns to their work in the Cut, or on the locks and dams, by labor trains. The largest labor train in the world was operated out of Panama to Pedro Miguel until July, 1912, when it was divided into two sections. These trains bring them to their homes, or the hotels, for the noon meal, consuming from ten minutes to half an hour in the journey. But as the rest period at noon is for two hours in the Canal Zone, ample time for eating is allowed. Tourists go through the

THE CULEBRA CUT

Cut on a special train that costs the government a great deal of money because of the disarrangement of dirt train schedules, every minute a shovel is kept idle thereby costing Uncle Sam a pretty penny and making the men swear because they may be sweating for a record day's work.

In the month of March, 1909, more dirt was taken out than in the first twenty-two months of operations. The excavation in one month usually exceeds an amount equal to the Pyramid of Cheops, which is 750 feet square and 451 feet high. The canal force of 1909-1910-1911 would have dug and finished the Suez Canal. March, 1911, retains the record for the greatest excavation in the Cut, when 1,728,748 yards were removed, and this also is the record month for excavation for the whole canal, with a total removal of 3,327,443 yards. The average daily output of steam shovels rose from 500 yards in 1905, when only dirt was handled, to 1,500 yards in 1911, when rock predominated. The cost in the Central division has ranged from 10 cents a yard to 91 cents a yard, with an average of 91 cents, from 1904 to 1909, and fell to 51 cents in 1911-12.

Rains interfere with the excavation work in the Cut, reducing the output in the rainy season several hundred thousand yards a month. During the downpours, operations must be suspended, but the Cut has been dug at a slant on both sides of the mountain system, so that water is drained out of it by gravity, running out at both ends. Rivers which crossed the line of

THE AMERICANS IN PANAMA

the canal have been diverted by digging new channels for them.

The precise date when the canal was half dug, in the year 1910, cannot be fixed until the water is turned into the Cut and dredges begin handling the slides, after ships are using the canal, but on a basis of 221,000,000 yards excavation, it was half done about July 1, 1910. Slides make a revision of the estimates almost a monthly task for the Chief Engineer. The Culebra cut was half finished about July 1, 1910.

Almost at the wind-up of operations the canal diggers made the highest records for excavation. On April 11, 1912, forty-four steam shovels took out 68,505 yards in the Cut, which is the record for one day in that division. Steam shovel No. 257 working at Gatun took out 5,554 yards in one day, the highest record in the Canal Zone for one shovel, the date being May 2, 1912, and in August, 1912, the same shovel made a record by removing 86,844 yards in 26 working days.

That part of the Central division which is little mentioned, extends from the Gatun locks to the entrance of the Culebra cut, about twenty-three miles. Only about 12,400,000 yards had to be excavated to complete this channel as it follows the Chagres River valley from about sea-level to Bohio, then the level rises until it reaches 48 feet above sea-level at the Cut. From Gatun to Obispo the Chagres River crossed the line of the canal twenty-three times. In the same distance the Chagres River has 26 tributaries, the more

THE CULEBRA CUT

important ones being the Gatun and Trinidad rivers. All contribute to the great Gatun Lake.

The slides, which have been accurately and inaccurately exploited in the press, represent the steep sides of the Culebra cut breaking off and falling down into the excavated part. Even where the Cut has been sunk through solid rock these slides occur, as the rock formations of the Isthmus are brittle and dissolve to dust after exposure to the atmosphere. An attempt was made to prevent slides by plastering the sides of the Cut with concrete, but the experiments were futile. There are between fifteen and twenty important slides on both sides of the nine-mile Cut, the largest being on the West side of the canal near the town of Culebra, and embracing 63 acres. Around the towns of Culebra and Empire are many smaller slides that have given much trouble to the engineers. Steam shovels, locomotives, and flat cars have been caught in these slides, but, singularly, few lives have been lost.

Sometimes the pressure on the sides of the canal operate to make the earth bulge up in the bottom of the Cut. Division Engineer Gaillard devised the plan of terracing the sides of the Cut to relieve this pressure with the result that much extraneous material has been prevented from sliding into the Cut. Engineers who formerly stood stanchly for the sea-level type of canal, after seeing the slides of the present 85-foot level lock type, are forced to admit that the attempt to sink a cut through the Isthmus for a sea-level channel would be attended by such prodigious

THE AMERICANS IN PANAMA

earth movements, necessitating such an inestimable additional excavation, as to make it well nigh impossible. For a sea-level canal the Culebra cut would have to go 85 feet deeper than in the present plan, which would require both a wider bottom and indefinitely wider surface opening, and then the slides would be immeasurably greater than at present. The best year's work in the Culebra cut was 16,586,891 yards. Slides first and last have added more than that amount to the total estimate of excavation for the division. Yet the increase in efficiency of the organization has enabled the workers to handle the extra amount within the time and cost estimated for taking out the original yardage.

Three methods of excavation have been employed in digging the seven miles of sea-level channel on the Atlantic side and the eight miles of similar channel on the Pacific side. Steam shovels dug down on the Atlantic side to forty feet below sea-level, with great dikes to hold out the water, and dredges have done the remainder of the excavating. On the Pacific side, in addition to dredges and shovels the hydraulic method has been used. This method consists of playing a powerful stream of water on the earth and draining the water with the soil in a fluid state to a selected dump which has been boarded, the water being drained off when the mud has deposited. The Atlantic entrance required an excavation of 47,523,000 cubic yards and the Pacific entrance 58,287,000 yards. On July 1, 1912, the former lacked 8,592,773 yards of



THE DEEPEST PART OF THE CULEBRA CUT.

THE CULEBRA CUT

completion and the latter 18,348,176 yards of completion. Of the amount removed to July, 1912, from both channels—78,868,134 yards—steam shovels excavated only 14,016,409 yards, but it was decided to remove most of the remaining material in the Pacific channel by steam shovels during the remainder of 1912 and in 1913, to about July 1st, when it is planned to take the great dredge Corozal through the channel, and locks up into the Culebra cut for the work of handling slides and silt after the water is turned into the Cut, in preparation for the passage of the first ship in September.

The following table shows the excavation year by year in the Culebra cut, from May 4, 1904, to May 4, 1913, a period of nine years of American operations:

From May 4, 1904 to May 4, 1905.	648,911 cu. yds.
“ “ “ 1906.	1,250,570 “
“ “ “ 1907.	4,861,895 “
“ “ “ 1908.	11,285,217 “
“ “ “ 1909.	13,955,753 “
“ “ “ 1910.	14,886,427 “
“ “ “ 1911.	15,925,976 “
“ “ “ 1912.	16,446,313 “
“ “ “ 1913.	14,754,155 “

9 yrs. 94,015,217 cu. yds.

By calendar years, the excavation in the Culebra cut is as follows, to September, 1913:

THE AMERICANS IN PANAMA

1904	243,472 cu. yds.
1905	914,254 "
1906	2,702,991 "
1907	9,177,130 "
1908	13,912,453 "
1909	14,557,034 "
1910	15,398,599 "
1911	16,596,891 "
1912	15,314,978 "
1913	9,200,000 "

99,015,217 cu. yds.

For the whole canal, the excavation year by year since 1904 was as follows:

May 4 to December 31, 1904.....	243,472 cu. yds.
January 1 to " 1905.....	1,799,227 "
" " 1906.....	4,948,497 "
" " 1907.....	15,765,290 "
" " 1908.....	37,116,735 "
" " 1909.....	35,096,166 "
" " 1910.....	31,437,677 "
" " 1911.....	31,603,899 "
" " 1912.....	29,258,852 "
" to August 31, 1913.....	13,653,564 "

205,933,379 cu. yds.

The above table estimates the excavation by the time the first ship is scheduled to pass through the

THE CULEBRA CUT

canal. Terminal works at Balboa requiring more than 8,000,000 yards excavation, and finishing details of the canal channel proper, will bring the total excavation, by January 1, 1914, when the canal is expected to be in regular commercial use, to 221,000,000 cubic yards.

It will be noted that the calendar year 1908 marks the highest record for annual excavation since the Americans began, overtopping the nearest year's record by more than two million yards. It also represents the amazing increase of two and a half times the output of the year 1907, just preceding it, the explanation of which is found in the fact that the long period of preparation has been passed in 1907 and the great canal organization, built up by Mr. Stevens, struck its stride and plunged dynamically at the natural obstacles.

The year 1908 recorded the greatest annual excavation in the Atlantic division, the year 1909 the maximum excavation in the Central division, and for the Pacific division the highest annual excavation was in 1910.

In the late spring of 1912, the press in the United States exploited the discovery of volcanic formations in the bottom of the Culebra cut. The engineers have not been alarmed by these vaporous emissions, which, in July, had about stopped, and were caused, according to the Commission geologist, by the warm atmospheric effect upon pyrite material. A great variety of colored stones are found in the blasted material in the Cut, and when cut and polished make attractive ring

THE AMERICANS IN PANAMA

settings and other souvenirs. One crystal-like stone has been found hard enough to cut glass. No coal or other usable minerals have been struck in the excavations.

In the first plans for relocating the Panama Railroad, it was designed to run the tracks on the edge of the Cut at an elevation of 10 feet above the water level, but the slides made this impossible. The new line was placed well back from the Cut away from the probability of slides. An observation tower used by thousands of tourists, back of the town of Culebra, for viewing operations in the Cut, was removed in June, 1912, just in time to prevent its sliding into the cut, and in August two slides near Empire threw 1,200,000 yards into the Cut, or more than a month's work.

It will be a time of mingled emotions when the canal employees stand on the side of the Cut, in 1913, and watch the waters of Gatun Lake creep up and cover the scene of nine years' work, and then to watch a ship pass in an interoceanic trip that has been the dream of four centuries.

CHAPTER XVI

LABOR

SAN FRANCISCO'S Exposition, in 1915, celebrating the formal opening of the Panama Canal, will be the most truly international Exposition ever held in this country or any other.

Not only is the object of the Exposition international in interest, but there is not a nation under the sun, possibly, which has not contributed some of its citizens to the construction force of the canal. Panama always has been cosmopolitan, a world transit route. The actual promise of building a canal, made when the Americans took charge, centered the eyes of the adventurous spirits of all races in the direction of the Isthmus.

Every nation which participates in the Exposition will feel a pride that the canal, in some measure, large or small, owes its being to the efforts of its own subjects. The list of nationalities, or geographical designations, represented among the employees of the Commission, or the Panama Railroad, gives an idea of the international appeal the canal exerts.

These eighty-six varieties of canal employees afford an opportunity to brush up on geography. In the census of the Canal Zone, taken in February, 1912, forty nationalities are listed, while in the following list, geographical subdivisions are noted to emphasize the variegated labor supply at Panama:

THE AMERICANS IN PANAMA

Africa.	Fiji Islands.	Norway.
Algeria.	Finland.	Panama.
Antigua.	Fortune Islands.	Peru.
Arabia.	France.	Porto Rico.
Argentine.	French Guiana.	Portugal.
Australia.	Germany.	Philippines.
Austria.	Greece.	Roumania.
Barbados.	Grenada.	Russia.
Belgium.	Guadeloupe.	San Salvador.
Bolivia.	Guinea.	Santo Domingo.
Brazil.	Guiana.	St. Croix.
Bulgaria.	Guatemala.	St. Kitts.
Bahama Islands.	Hindustan.	St. Lucia.
Bermuda Islands.	Honduras.	St. Martins.
Bohemia.	Holland.	St. Thomas.
British Honduras.	Hungary.	St. Vincent.
Canada.	Iceland.	Scotland.
Chile.	India.	Spain.
China.	Ireland.	Sweden.
Colombia.	Italy.	Switzerland.
Costa Rica.	Jamaica.	Syria.
Cuba.	Japan.	Trinidad.
Curacao.	Liberia.	Turkey.
Demerara.	Martinique.	Turks Island.
Dominica.	Mexico.	Uruguay.
East Indies.	Montserrat.	Venezuela.
Ecuador.	Nassau.	West Indies.
Egypt.	Nevis.	
England.	Nicaragua.	

At the beginning of the American occupation, in 1904, there were 746 men employed on the canal. According to the Quartermaster's department the highest force of record since then was on March 30, 1910, when the pay-rolls showed 38,676 employees. This record nearly was reached on January 10, 1912, when there were 38,505 employees on the rolls. The census report, as of February 1, 1912, estimated the num-

LABOR

ber of employees as 42,174, for the Commission and the Panama Railroad, which would be the record force in the history of the project, and not likely to be equaled again with the canal nearing completion.

In the following tables the maximum force for each year under the Americans is given, from figures reported by the Quartermaster and the Sanitary department. The discrepancy in favor of the Sanitary department is accounted for by the fact that from five to ten thousand workers always have been in the Canal Zone in excess of the number actually employed, and had to be cared for the same as the regularly employed men. The third column shows the number of Americans in the Canal Zone for the same period.

Year	Quarter- master	Sanitary Dept.	Ameri- cans
1904	3,500	6,213	700
1905	10,500	16,512	1,500
1906	23,901	26,547	3,264
1907	31,967	39,238	5,000
1908	33,170	43,891	5,126
1909	35,405	47,167	5,300
1910	38,676	50,802	5,573
1911	37,271	48,876	6,163
1912	38,505	48,000	6,008

The percentage of Americans in the total working force usually has been one sixth or one seventh. Their work is of a supervisory character, or skilled labor, such as mechanics, carpenters, plumbers, masons, electricians, etc. They also are the steam shovel,

THE AMERICANS IN PANAMA

locomotive and marine engineers, railroad conductors, time inspectors, firemen, policemen, all branches of civil administration, office forces, sanitary and hospital officers, foremen, civil engineers, and the like. In 1912 there were 4,064 wives and children of American employees.

Laborers did not come to the Canal Zone in sufficient numbers during the early years, necessitating recruiting offices in Europe, the West Indies, and the United States. A total of 43,000 men were imported under contract with the Commission, from 1904 to 1910, and it was thought the labor problem had been solved, but in July, August, and September, 1911, it became necessary to import 1,300 laborers to fill up the ranks depleted by the migration of employees to other Central and South American fields.

Spain furnished the largest number of European laborers to the canal until the government of that country, in 1908, forbid further emigration to Panama. The Spaniards also proved to be the most satisfactory common labor employed by the Commission. Out of a total of 11,797 European laborers imported to 1910, 8,222 were Spaniards, and the others came principally from Italy, France, and Armenia.

The colored labor predominates in the Canal Zone and was obtained in the islands of the West Indies. Barbados furnished the largest number, 19,448; Martinique, 5,542; Guadeloupe, Jamaica, Trinidad, St. Kitts, Curacao, Fortune Islands, etc., 4,677—a grand total of 29,667. Costa Rica, Colombia, and Panama

LABOR

furnished 1,493: unclassified, 2,163. The largest immigration for one year was in 1907, when 14,942 laborers were imported, while in 1906, 12,609 arrived.

Chief Engineer Stevens in his first annual report estimated the native labor to be about 33 per cent as efficient as common American labor. However, this standard has been raised under the perfection of the organization in later years, though nothing like the capacity for hard and effective work, shown in labor under private management in the United States, has been developed. Mr. Stevens asked for bids for supplying 2,500 Chinese coolies to the Canal Zone, in 1906, with a provision for 15,000 if needed, but this move never resulted in importing any Chinese under contract. Conditions as to pay, quarters, and treatment received such favorable advertising that, in 1910, more than 2,000 Europeans voluntarily came to the Canal Zone to seek employment.

The color line has been drawn in the Canal Zone by dividing the employees into "gold" and "silver" men. In the first category are the Americans, and in the second the common and unskilled laborers. Wages are paid in silver to the laborers and salaries to the Americans are paid in gold. This distinction is not a hard and fast one and the idea was adopted as the best means for the Government to draw the color line—a practice it would not attempt under the Constitution in the United States. Second-class coaches are provided on the trains, special windows in the

THE AMERICANS IN PANAMA

post offices, special clerks in the commissary, and separate eating places for the silver employees.

Stability has not been a feature of the American working force at Panama. In 1911, the gold force changed to the extent of 60 per cent, and the average stay on the Isthmus, of mechanics, has been only one year. The reason for this is found partly in the fact that many workers come simply to see the big job and make expenses while on the trip and partly in the lack of diversions after work hours. There are saloons in the Canal Zone, and the clubhouses afford billiards, pool, bowling, gymnasium, reading room, and a weekly moving picture show, but the simple life rules supreme, pallng on those who have a taste for the gay white lights. Panama and Colon do not afford much greater entertainment if they were easily accessible to the inland canal employees. This lack of relaxation and recreation facilities is the only drawback to the otherwise ideal working conditions in the Canal Zone. Eat, sleep, and work is the monotonous round of the canal employee and the most of them save money.

Tourists in the Canal Zone commonly do not see the great shops at Gorgona and Empire, where repairs for the machinery and equipment used in building the canal are made, and where original iron and steel construction is done. The Gorgona shops cover about 22 acres and have seven miles of tracks. Much small iron work, such as making bolts, machinery parts and pattern work, is done more cheaply than in the United States, when freight to the Isthmus is considered.

1



2



3



4



1. OLD FRENCH LOCOMOTIVE. 2. STEAM SHOVEL. 3. SLIDE IN
CHILPRA CUT. 4. TRAIL S.

LABOR

Owing to the long distance from the base of supplies these shops early were equipped to do any work the canal plant might require. All equipment on the canal receives rough handling in the desire to make records in excavation, dumping or concrete laying, with the consequence that the shops usually are crowded with broken down dump cars, locomotives, steam shovels, and other apparatus. Gorgona is the Pittsburgh of the Canal Zone. The town and shops will have to be abandoned before the opening of the canal as the waters of Gatun Lake will surround it, and cover the present shop site.

Many labor-saving devices have been born of necessity in the Canal Zone. The honor for inventing the greatest of these belongs to W. G. Bierd, formerly general manager of the Panama Railroad, and the man who most largely was responsible for bringing that archaic system from chaos to order, under Chief Engineer Stevens. He originated a Track Shifter which does the work of 500 men in one day and requires only nine men to operate it. This locomotive machine has a crane which raises the tracks, ties and all, clear of the ground, then swings it to the side for three feet or more, according to the elasticity of the rails. Thus the hand method, of pulling out spikes, removing the ties to the desired place and relaying the rails, is abolished. If we figure that one track shifter has worked an average of 300 days in the last six years, it has done work which by the old hand method would have required more than 1,000,000 men to do in one day, or 500 men working each day during the

THE AMERICANS IN PANAMA

six years. The track shifter in that six years required 16,200 men, on the basis of nine men a day, for its operation. There were three track shifters when Col. Goethals took charge in 1907 and there were ten in 1912. At 10 cents an hour, 500 men a day would cost \$400. In a year this would be \$120,000 and in six years \$720,000, but that estimate of the cost by the hand method is too low, and when the number in use is considered, making allowances for hours not at work, the track shifter has saved the government several million dollars. Mr. Bierd received nothing from the Commission for his invention. A Spaniard who devised a simple method of dumping steel cars received \$50 a month royalty.

Strikes have never been successful in the Canal Zone. In 1904 President Roosevelt gave the Commission the power to expel anybody from the Canal Zone who, in its discretion, was not necessary to the work of building the canal, or was objectionable for any reason. No such power resides in any American State government, but the Supreme Court held that the Canal Zone was not under the Constitution and was subject to the regulation of a military reservation. The President took the wise view that the Americans were there for the express purpose of building a canal and nobody should be allowed to remain whose conduct or presence might clog the wheels of construction. This power also has been used to expel undesirable women as well as men.

On November 22, 1910, the boilermakers in the Gorgona and Empire shops struck for higher pay, and

LABOR

for the same vacation allowance given to employees on a monthly pay basis. They were receiving 65 cents an hour, or about 40 per cent more than similar work in the United States earned, and in addition had quarters free. Their demand for 75 cents an hour was refused but two weeks' vacation with pay and extra time without pay was granted. Although the strike crippled the shops for a few weeks, Col. Goethals saw to it that they left on the first steamers out for the United States and the Washington recruiting office soon supplied their places. The steam-shovel men, in a restive mood, met the same treatment and the locomotive engineers, who threatened a walk-out, thought better when they had the alternative of returning forthwith to the United States, or going to work, presented to them.

This peremptory manner of handling employees is justified only by the peculiar conditions at Panama. In truth there never has been any excuse for strikes or dissatisfaction with working conditions, after the first two years. The canal employees are the most pampered set of workers in the world. An eight-hour day with a two-hour intermission at noon, first-class board cheaper than in the United States, free quarters, free medical service on full pay, nine holidays on pay, reduced railroad rates, wages and salaries from 30 to 80 per cent higher than in the United States, an annual vacation of forty-two days on full pay for gold employees, and the necessities of life for sale at lower prices in the government commissary than in the United States.

THE AMERICANS IN PANAMA

Yet, with conditions of employment on this utopian basis, there has been considerable complaining. These complaints reached the limit of absurdity, in 1912, when a petition was presented to Col. Goethals asking that employees be paid for all the sick leave they did not use during the year. In other words, as an employee could be sick for thirty days on pay in one year, if he was sick only five days they asked that the twenty-five days not used, during which he was being paid for his work, should receive an additional compensation of full pay for that time. It was a plain invitation to the government to pay employees not to get sick. Col. Goethals said the Commission could not even consider such a proposition.

It is a noticeable fact to one who spends several months among the canal employees that many look upon themselves much in the light of war veterans who should be pensioned or receive special consideration from the government. Certain older employees are the worst offenders in this way. They think the government owes them some sort of a position at equally good pay for the remainder of their lives. The proposal to reduce salaries, for the permanent operating force, to a point 25 per cent above the standard in the United States is scouted by them as preposterous. Many of those who went through the hardships of the first two years, although they stayed with the job because it looked good as a business proposition, now assume that such service entitles them to be ranked as national heroes who henceforth are to be the wards of Uncle Sam's bounty. When they finish at Panama

LABOR

they expect to be shifted to positions in the government service elsewhere, at the same pay, which would be impossible, unless they were made bureau chiefs or salaries should receive a perpendicular treatment unknown to the civil service in the United States. The older employees are thinning out, however, as may be noted by the statement that in May, 1912, there were only 63 employees who had come in 1904.

No one realizes how generous the government has been to its employees at Panama more than the employee who leaves the service to return to work in the United States. Over and over again such employees have returned to the Canal Zone to take work at wages or salaries less than they were receiving when they quit. One foreman drawing \$250 a month in Panama decided he could do as well at home. In a year he returned to the Canal Zone and gladly took a position at 65 cents an hour, or about \$132 a month. The cost of living, and standard of pay, in the United States made him repent his action.

In many departments the government work at Panama is not as exacting in its standard of efficiency as under private industry in the United States. This especially is true of the transportation department where young fellows are drawing \$190 a month, as dirt train conductors, who could not earn \$65 a month as cub brakemen on a high-grade American railroad. The high pay in the Canal Zone not only draws employees back to the job, but the pace of American industrial life is so much swifter than the easy-going canal organization, that this, too, makes them think

THE AMERICANS IN PANAMA

of the flesh-pots of Egypt. The steam-shovel men, who are after records, come nearer to the mark of efficiency in the United States than perhaps any other class of employees. Efficiency here is used in the sense not only of capability but of productivity, for necessarily the canal organization is capable in its engineering and administrative departments, but has most of the ear-marks of a government job—the-take-your-time-and-don't-overwork characteristic.

Any employee on a monthly salary basis may take eighty-one days off at full pay in every year. He has a vacation of forty-two days on pay, a sick leave of thirty days on pay, and nine holidays on pay, a total of eighty-one days that the government voluntarily deprives itself of the employee's services. The sick leave, too, is pretty generally used up by the employees, who have little trouble in persuading a district physician they need a rest at Taboga sanitarium or Ancon hospital. It is apparent that the government has invested some of its millions in a way no private contractor could follow, except into bankruptcy. If an employee does not take his vacation one year, he can accumulate it for the next year, and so get 84 days at full pay, and his trip to the United States will cost him only \$20 or \$30 a one-way passage.

Pay days until October 1, 1907, were semimonthly. Since then monthly pay days have been the custom, the pay car starting out on the 12th and finishing in three days for the entire Canal Zone. The Disbursing Office, at Empire, is a great bank handling nearly \$3,000,000 a month. A Chinaman and a Hindoo are

LABOR

the expert money counters in this office. Payments for wages have increased from \$600,000 monthly, in 1905, to nearly \$2,000,000 a month as a maximum in 1910-1911-1912.

Silver employees, or common laborers, earn 5, 7, 10, 13, 16, 20, and 25 cents an hour, with a few exceptions at 32 and 44 cents an hour, and a maximum monthly silver rate of \$75.

Gold employees, which includes all the Americans, are paid from a minimum of \$75 monthly to a maximum of \$600 monthly, not including in this classification heads of departments. Col. Goethals, as Chairman and Chief Engineer and President of the Panama Railroad Company, receives \$21,000 annually; other members of the Commission, \$14,000 annually; clerks, from \$75 to \$250 monthly; draftsmen, \$100 to \$250; engineers, assistant, special and designing, \$225 to \$600; foreman, \$75 to \$275; inspectors, \$75 to \$250; marine masters, \$140 to \$225; master mechanic, \$225 to \$275; physicians, \$150 to \$300; district quartermasters, \$150 to \$225; hotel steward, \$60 to \$175; storekeepers, \$60 to \$225; superintendents, \$175 to \$583.33; supervisors, \$200 to \$250; teachers, \$60 to \$110; trainmaster, \$200 to \$275; yardmaster, \$190 to \$210; nurses, \$60 to \$150; policemen, \$80 to \$107.50; master car builder, \$225; fire department privates, \$100; traveling engineer, \$250; accountants, \$175 to \$250; musical director, \$166.67; mates, \$100 to \$175; postmasters, \$50 to \$137.50.

Wages on an hourly basis are in part as follows: apprentice, 10 to 25 cents; blacksmith, 32 to 70 cents;

THE AMERICANS IN PANAMA

boilermakers, 32 to 70 cents; bricklayers, 65 cents; car inspector and repairer, 32 to 65 cents; carpenter, 32 to 65 cents; ship caulker, 65 cents; coach cabinetmaker, 65 cents; coppersmith, 32 to 65 cents; ironworker, 44 to 70 cents; lineman, 32 to 65 cents; machinist, 32 to 70 cents; molder, 32 to 70 cents; painter, 32 to 65 cents; pipefitter, 32 to 65 cents; planing mill hand, 32 to 56 cents; plumber, 32 to 75 cents; tinsmith, 32 to 65 cents; wireman, 32 to 65 cents; shipwright, 44 to 65 cents; locomotive engineers earn from \$125 to \$210 monthly; steam-shovel engineer from \$210 to \$240; steam engineer, \$75 to \$200. The hourly rates quoted run as high as 62 per cent greater than the pay for similar work in the United States Navy yards, or private industries.

The canal was estimated to cost \$375,000,000. Out of that amount, the part which had gone into wages and salaries to June 30, 1912, was approximately \$120,000,000. By the time the canal is finished, and opened for permanent use, in 1914, this item will reach the startling total of \$150,000,000. From 20 to 25 per cent of it has gone into salaries of officers and supervisory employees, and from 75 to 80 per cent into wages to skilled and unskilled labor.

The Commission has the work of repatriation of imported employees already under way. While nearly 45,000 workers were imported under contract that provided for their return home when the canal was done, the Commission will not have anything like this number to repatriate as thousands have left voluntarily to new fields of labor or quit the service under conditions

LABOR

that forfeit their right of return at the Commission's expense. It will not be difficult to get sufficient common labor for the permanent canal.

As the conglomeration of races presents names impossible of uniformly correct spelling, every employee has a numbered brass check for identification, which he must show to get his pay.

CHAPTER XVII

COMMISSARY—QUARTERS—SUBSISTENCE

DURING the first year of American operations in Panama, the problem of food and merchandise supply for the army of workers was not worked out. The Panama Railroad long had maintained a commissary for its employees, but its facilities totally were inadequate, as they existed in 1904, for satisfactory service to the increased thousands of employees and their families.

Chief Engineer Stevens, in 1905, turned his attention to this problem as one, upon the proper solution of which would depend satisfactory conditions of living for the canal workers. By April, 1907, when he resigned, the present commissary and hotel systems, as well as the system of housing the employees, which challenge the admiration of the tourist, had been created, and all that was left to Col. Goethals to do, in this phase of the task, was to enlarge the systems as the organization expanded.

Under Mr. Stevens the Department of Labor, Quarters, and Subsistence covered the whole ground. In 1908, Col. Goethals modified the organization by creating a Quartermaster's Department along Army lines, which had charge of all buildings and the accountability for all physical property of the Commission, the recruiting of labor, storage of material and sup-

COMMISSARY—QUARTERS—SUBSISTENCE

plies, collection of garbage, distribution of commissary merchandise to employees, and the cutting of grass as directed by the Sanitary Department. A Subsistence Department then was created, which in addition to operating the hotels, kitchens, and messes, was given supervision over the Panama Railroad Commissary. The bookkeeping for the commissary, however, is done by the railroad company and the profits go into its accounts, but as the government owns the railroad, the distinction only is one of bookkeeping.

Merchants in Panama and Colon objected to a government commissary on the idea that it would be a competition not contemplated when the Canal Zone was ceded, and they made overtures to the Commission for taking over the business of supplying canal employees with the necessities of life. Had this been done an inconceivable amount of dissatisfaction would have resulted, through the ruinously high prices the employees would have been compelled to pay for the privately owned merchandise.

The government has made a profit from the commissary operations because it arbitrarily has fixed the price of commodities at a point which would pay for the construction of storehouses, and the usual expenses of merchandising two thousand miles from the markets of the world. But, owing to the immense quantities in which all articles are bought, and the absence of a grasping policy as to profits, the canal employees customarily buy almost everything more cheaply than the same merchandise sells for in the United States.

THE AMERICANS IN PANAMA

For one reason, there is no tariff in the Canal Zone. Foreign made goods are imported without the expense to the consumer that the high protective duties at home necessitate. Irish linens, English and Scotch cloth, French perfumery, Swiss and Scandinavian dairy products, and a wide variety of other European manufactures, make the commissary, with the American merchandise in stock, a great department store which in the fiscal year 1912 did a business amounting to \$6,702,355.68.

General headquarters are at Cristobal, on the Atlantic side. The steamships of the Panama Railroad Line every week replenish the food supplies with seasonable offerings from the American markets. The scope of the operations include a laundry, bakery, ice cream plant, ice factory, cold storage, coffee roasting plant, and laboratory for making extracts.

The year 1911 is typical of the scale on which the commissary has been operated since 1906. Importations of principal commodities were as follows:

Groceries	\$1,278,594.79
Hardware	86,768.86
Dry Goods	603,490.18
Boots & Shoes	164,168.89
Cold Storage Supplies	1,573,202.97
Furniture	9,020.48
Tobacco	182,590.96
Raw Materials	215,375.22
Paper, Stationery, etc.....	54,579.05
Total	\$4,267,792.05

COMMISSARY—QUARTERS—SUBSISTENCE

These importations do not represent the total transactions of the commissary for that year, as the stock on hand, and bought on the Isthmus, ran the volume of business to \$5,754,955.69. Of this amount the Commission paid \$1,625,348.77 for supplies used in the hotels, messes, kitchens, and elsewhere; and \$3,609,358.01 represents the amount of the total which was paid by employees using coupon books. Nineteen stores were operated in as many settlements and towns and the average monthly business was \$479,579.69.

No cash sales are made at the Commissary. Employees are issued coupon books in value from \$2.50 to \$15.00 and containing coupons ranging in face value from one cent to twenty-five cents. Enough coupons are torn out by the clerks to cover each purchase. At the end of each month the value of the coupon books is deducted from the employee's salary. In 1912 the practice of selling coupon books for cash was extended to the employees. Formerly no books would be issued after the 28th nor before the 4th of each month, and a gold employee could only ask for books to the extent of 66 $\frac{2}{3}$ per cent of his salary, or a silver employee for not more than \$15 in any one month. While the old method still is in vogue, by selling books for cash the employees who thoughtlessly failed to provide books to run them through the month may supply their needs. The books are not transferable.

The quantities of various articles handled by the commissary in the year being reviewed were as fol-

THE AMERICANS IN PANAMA

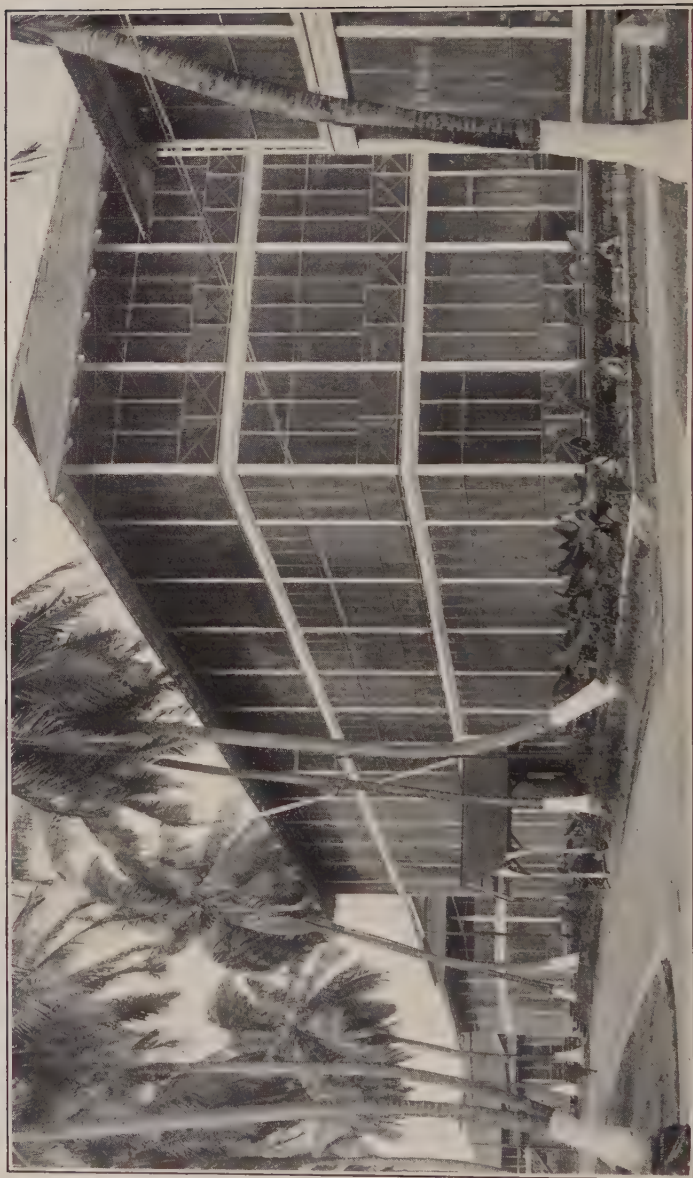
lows: Eggs, 692,060 dozen; butter, 429,267 pounds; meats, 9,241,858 pounds; poultry, 554,028 pounds; milk and cream, 86,466 gallons; coffee, 320,491 pounds; flour, 16,638 barrels; ice, 33,267 tons; ice cream, 110,208 gallons.

At 4.30 o'clock each morning a special train of from fourteen to eighteen cars leaves Cristobal with fresh supplies for the towns in the Canal Zone. The branch stores usually have small cold storage facilities to preserve such meats and perishable goods as may be necessary for the day's operations. Once a month the Commissary Bulletin is issued, with price lists and announcements of special sales on various articles. The feminine instinct for bargains thus is not atrophied by residence in the Canal Zone.

While the cost of living has been a rampant issue in the United States, the canal employees have enjoyed comparatively lower prices, as well as a greater purchasing power because of higher pay.

One central laundry is operated for the white, or gold, employees. In 1911 there were 7,260 patrons and 3,581,923 pieces were laundered. Patrons deposit their bundles at the branch commissaries in the respective towns and they are collected for shipment over the railroad to Cristobal. By this centralization of work the cost is from 30 to 50 per cent lower than for similar work in American cities. Cleaning and pressing are done for both men and women's clothes at correspondingly low rates.

Panama hats are not as extensively worn by the Americans as one might imagine, and they are not a



Photograph, Underwood & Underwood, N. Y.

HOTEL AND QUARTERS FOR AMERICAN EMPLOYEES.

COMMISSARY—QUARTERS—SUBSISTENCE

great deal cheaper than in the United States. Contrary to popular belief, Panama hats are not made in Panama. They are made in Colombia, Ecuador, and Peru, the finest coming from Montecristi, Ecuador. Years ago traders from those countries were in the habit of bringing the hats to Panama to sell to ships bound for the United States or Europe, and so they came to be known as Panama hats. Imitations are made in Jamaica and Porto Rico and many frauds are perpetrated upon the American people by dealers who profess to have genuine Panama hats at prices sometimes lower than our tariff would be on the real article. Prices vary according to the length of the fibers used in their manufacture, the finest ones being without any seams, and cost as high as \$150.

QUARTERS

Early in 1905, the Commission advertised free quarters to both married and bachelor employees as a special inducement to come to the Canal Zone. Thus, in addition to high pay the employees have no house or room rent to pay. This alone constitutes a sharp increase in an employee's income over what he could earn in the United States for similar work, but this is not all he receives gratis.

It has been figured that in six years the Commission grants to each married employee gratuities that cost it \$3,000; and to a bachelor employee gratuities that cost \$750. The monthly service, such as commissary, fuel, and distilled water deliveries, removal of garbage, etc., to a married employee costs \$12; and

THE AMERICANS IN PANAMA

janitor service, and other service to a bachelor employee costs \$2.25 monthly. In six years an average force of 5,000 employees has been entitled to these gratuities and it is figured that the total investment by the Commission in that period for all free service and gratuities runs between ten and twenty million dollars.

To a married employee the free allowance is as follows: An individual house, or an apartment in a building with two or four families; a range, a double bed, two pillows, six dining chairs, two kitchen chairs, one chiffonier, two center tables, a mosquito bar, a refrigerator, a double dresser, a double mattress, a kitchen table, a dining table, sideboard, bedroom mat, and three wicker porch chairs.

The Quartermaster's Department delivers purchases from the commissary and ice; the fuel used in the kitchen stove is free, as are electricity and hydrant and bathroom water. Telephones are free if the employee needs one in connection with his duties. Housekeepers must buy their own tableware, bedclothes, light furniture and bric-a-brac.

Married quarters were assigned, in 1905 and 1906, on the basis of one square foot for each dollar of salary, with extra allowances for the wife and children. This method was abandoned and quarters are assigned without regard to salary, except that officials receive first consideration. There are one, two, and four family houses, entirely screened on the outside. As a rule there has been a scarcity of married quarters and occasionally of bachelor quarters. Every

COMMISSARY—QUARTERS—SUBSISTENCE

house, or apartment, has its shower bath, tubs not being used, and each town has a complete sewer system.

Bachelors, whether men or women, are treated correspondingly well. Quarters with two, three, or four in a room, and janitor service are free. In the early days there was unpleasant crowding because of the scarcity of buildings, but only occasionally has there been congestion in late years. These buildings shelter from a dozen to sixty men and like the married quarters are screened on the outside. A war was waged until vermin practically was eradicated. They are electrically lighted and have the usual shower bath and sanitary arrangements. Barracks of a less pretentious architecture are provided for the silver employees.

Hotels operated by the Commission are the boarding places for the bachelor employees. The wide verandas are screened and tables here are reserved for the bachelor girls, and for the men who wear coats at meal time. Inside the employees may eat in their shirt sleeves. The meals cost thirty cents each and are paid for by coupons that come fifty to the book. These books cost \$15, and the amount is deducted from the employee's salary at the end of the month, so that no cash is handled at the hotels, except from nonemployees, who must pay fifty cents for a meal.

The fare could not be duplicated in the United States for seventy-five cents a meal. A typical thirty-cent menu includes soup, two kinds of meat, four kinds of vegetables, hot rolls or light bread, a salad, tea,

THE AMERICANS IN PANAMA

coffee, or cocoa, and for dessert, ice cream or pie. On every table are fruit, olives, preserves, condiments—and for several years in the early stages, an open bowl of quinine as a malarial antidote. To even up with the free goods given to married employees, the Commission furnishes the hotels their stoves, furniture and fuel and does not include these items in figuring the cost of operation.

The hotels for the gold employees usually have been operated at a slight loss, while the European laborers' messes and the colored laborers' kitchens have shown a profit. At the messes for the Europeans, principally Spaniards and Italians, the cost of three meals is forty cents, while at the kitchens where the West Indian laborers get their food cooked, to take away and eat, the cost is thirty cents for three meals. The food is always wholesome and plentiful and the tastes of the various nationalities are studied to give them that to which they are accustomed. The West Indians consume more than 100 tons of rice monthly, the Italians want macaroni, and the Spaniards eat vast quantities of bread.

Stewards at the hotels for the gold employees found that each man averaged only two meals a day. The saving to an employee by cutting out one meal is \$9 a month. They substitute fruit, or a sandwich from the clubhouse, for the third meal and in the two they do eat, stow away enough to satisfy their needs. Three meals a day at thirty cents each would cost \$27 a month. Two meals a day, or sixty for the month, cost \$18. Some of the employees cut out breakfast

COMMISSARY—QUARTERS—SUBSISTENCE

and some lunch, so the stewards prepare food for an average of two meals per employee.

The Tivoli Hotel at Ancon, on the Pacific side, is the tourist hotel operated by the Commission. Its rates, American plan, are \$5.50 a day and up. During the dry season it is crowded with guests, in 1912 about 14,000 tourists having visited the Canal Zone. There are 218 rooms and a dining room that will seat 750 persons. An addition was finished in 1912 at a cost of \$57,000. At Colon, on the Atlantic side the Commission is building the Washington Hotel, to cost \$500,000, for the use of visitors to the Canal Zone.

In 1911, the hotels for American employees showed a loss of \$20,905.44; European messes, a profit of \$39,236.63; colored laborers' kitchens, a profit of \$14,461.95; and the Tivoli Hotel, a profit of \$26,227.05.

Still another factor that makes living in the Canal Zone cheaper than in the United States is the result of the climate. With a uniformly warm temperature, the quality of clothes does not vary the year round. For the women, light summery goods, largely white; for the men, duck or linen suits or light staple cloths. The saving from not having to buy new clothes with the change of seasons is important, and the employees generally try to arrange their vacations so as to be in the United States in mild weather. Class distinctions are not drawn rigidly, so that there is not a furious competition in dressing or keeping up appear-

THE AMERICANS IN PANAMA

ances, but there decidedly is no "slouch" in the Canal Zone.

A bride starts out life there on a basis that means a rude jolt to her when the canal is finished and she returns to the United States. Young couples who have been treading the easy path of high salary, free rent, free water, light and fuel, cheaper food, clothes and furniture, elastic class distinctions and plentiful though not efficient servants, must ever look back upon their Canal Zone experience as the particularly bright period in their careers. The withering blasts of social competition, high cost of living, and salaries from one to two thirds lower in the United States, will make the easy-going, over-generous life at Panama seem the "temps de luxe" in their lives.

Transient writers visiting the canal dilate on the happy demeanor of the employees. A perusal of the foregoing conditions of employment would suggest that a good many million dollars of government money have been spent to buy that joyousness. The employees have a very happy time at the expense of the American people, yet it has been a better way of investing money than maintaining useless navy yards, or \$100,000 Federal buildings at Western prairie hamlets!

CHAPTER XVIII

CIVIL ADMINISTRATION

HAVING undertaken an eleven-year task in Panama, the Americans realized at the outset that it must be gone about with the deliberation of a permanent settlement in the tropics. The problem was to duplicate the civilization of the United States on a scale suitable to the Canal Zone, so that the employees and their families would not lack for anything essential to their happiness and normal advancement.

In the first conception of the needs of the situation, the position of Governor was created, with Maj.-Gen. George W. Davis as the head of civil government. His powers were coextensive with the Chief Engineer and the Chairman of the Commission. During the year he spent in the Canal Zone as Governor, Maj.-Gen. Davis was occupied with engineering problems and in settling disputed points with the Republic of Panama, but substantial progress in organizing the powers of government was made.

Charles E. Magoon was appointed Governor on April 1, 1905, to succeed Maj.-Gen. Davis, and he served until September 25, 1906. Gov. Magoon had powers as extensive as Gov. Davis, and the present civil government was rounded into form under his direction. Ex-Senator Jo C. S. Blackburn, of Ken-

THE AMERICANS IN PANAMA

tucky, became the head of civil government with the Goethals Commission on April 1, 1907, but the President had transferred the vital powers of the office to the Chairman and Chief Engineer, and thenceforward the Governor was known as the Head of the Department of Civil Administration. Gov. Blackburn resigned on December 4, 1909, and was succeeded on April 12, 1910, by the Hon. Maurice H. Thatcher, also of Kentucky.

This department conducts the diplomatic affairs of the Commission with the Republic of Panama and the representatives of foreign governments in Panama. It is organized as follows: Division of Posts, Customs, and Revenues; Division of Police; Division of Schools; Division of Fire Protection; Division of Public Works; Division of Courts.

The Division of Posts, Customs, and Revenues has the supervision of the Canal Zone post offices, the entrance and clearance of ships at Cristobal and Balboa, the leasing and taxing of government lands, and the laying and collecting of taxes on houses, occupations, and businesses. Every settlement has a post office, which the employees used as a bank until the opening of the postal savings system on February 1, 1912. Since the opening of the money-order department on June 1, 1906, the Canal Zone post offices have sold more than \$25,000,000 in money orders. Out of this amount more than \$5,000,000 was for money orders payable in the Canal Zone and represents a practice of buying the orders to have a safe depository of surplus earnings. When an employee

CIVIL ADMINISTRATION

desired his money, he presented the money order payable to himself. In 1911 the money-order business was \$5,304,906.60, divided among 214,000 orders. The great bulk of the orders was payable in the United States. Postage rates are the same as in the United States, but Panama stamps are used.

Spanish taxing methods were followed, so far as was practicable, by the Americans in dealing with the natives. The sixty or seventy saloons that the Commission licensed in the Canal Zone are regulated strictly and pay an annual license, each, of \$1,200. Selling liquor on government property is another instance where the Canal Zone is an exception to the rules followed in the United States. Only revocable leases for lands are issued to the natives now, so that the Canal Zone may be cleared of all but employees on short notice.

The Division of Police was organized by George R. Shanton, a Western type of rough-and-ready sheriff, specially selected by President Roosevelt. The division now is a well-disciplined body of officers and men, numbering forty-one of the former and 233 of the latter, of which all the officers and 117 of the privates are white. Each town has a police station, and, considering the conglomeration of races, the Canal Zone is conspicuously law-abiding.

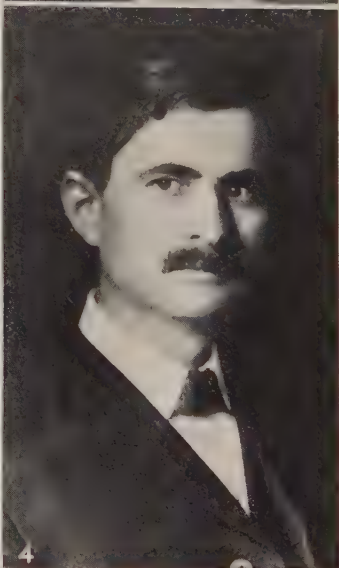
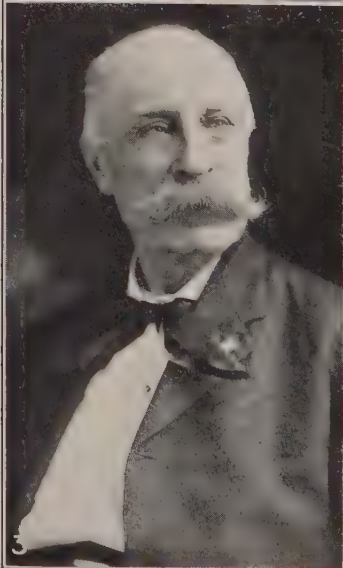
The judiciary system as developed for the Canal Zone includes a Supreme Court at Ancon, circuit courts and district courts, with right of appeal to the Federal courts of the United States. It was not until February 6, 1908, that jury trials for capital offenses

THE AMERICANS IN PANAMA

were granted, as President Roosevelt wanted "frontier" justice to prevail, on the idea that discipline among the employees and population best could be maintained thereby. The first execution for a capital offense was on November 20, 1908. The first jury trial was on March 19, 1908. The natives found American ideals of justice somewhat exacting, especially the one requiring all those of opposite sexes who lived together to be married formally. Free love was a practice of long standing. A penitentiary, maintained at Culebra, will be relocated on the east side of the canal for the permanent organization. The native people have been nick-named "spiggoty" by the Americans from their expression "speeka-da-Engleesh," which finally was contracted into "spiggoty."

Fires have been unusually rare occurrences in the Canal Zone, where all construction is frame. The largest and only fire of consequence was at Mt. Hope on April 1, 1907, when the quartermaster's storehouse was destroyed at a loss to the Commission of \$100,000. There are sixteen officers and forty-six firemen on the regular pay-rolls, and there have been as many as eighteen volunteer companies with 295 members. The equipment is of the most modern American type.

Gov. Magoon opened the first public school in the Canal Zone on January 2, 1906. In 1912 there were 25 buildings for both white and colored pupils, with 46 white and 28 colored teachers, an enrollment of 1,240 white and 1,524 colored pupils, and an average



*Photos, 1, 2, 3, Harris & Ewing, Washington, D. C. ;
4, International News Service.*

1. MAJ.-GEN. GEORGE W. DAVIS. 2. CHARLES E. MAGOON.
3. JO C. S. BLACKBURN. 4. M. H. THATCHER.

CIVIL ADMINISTRATION

attendance for the former of 904, and of the latter, 688. The schools have a number of disadvantages to overcome, not the least of which has been the epidemic of matrimony that has raged unremittingly among the teachers. Sometimes the personnel changes 40 per cent from this factor alone. Another factor has been the diversity of standards and nationalities. In one year the teachers were from 16 different states, bringing as many systems of education into their work; 732 pupils had come to the Canal Zone from thirty-six states, and there were twenty-one nationalities other than American. To weld all these heterogeneous elements into a uniform system has been a difficult task. Transportation over the railroad to and from the schools is free to the pupils, as are the books and other materials used. High schools are maintained at Gatun and Ancon.

Social life in the Canal Zone expresses itself in weekly dances at the clubhouses and Tivoli Hotel, in woman's clubs, lodge auxiliaries, church societies, and the usual round of parties. The Commission has furnished houses for use by the lodges and religious denominations, many of which are represented in regular meetings and services. The clubhouses, under the supervision of the Y. M. C. A., are the social centers of each community, as the women are given limited privileges. Soft drinks, tobacco, and luncheons may be obtained at the clubhouses at all hours. The annual cost of operating them is about \$150,000, the Commission paying the deficits where the membership fees do not cover the expenses.

THE AMERICANS IN PANAMA

The Panama Lottery has found in the canal employees generous patrons. It was started in 1883, with a provision in the concession that 64 per cent of the income should be paid out in prizes. When the President, in 1904, forbade the sale of the tickets in the Canal Zone, the Lottery Company thought they had been damaged several million dollars' worth, but the Americans have been able to get all the tickets they wanted, either by going into Panama and Colon for them or sending others. A full ticket costs \$2.50 and may draw a prize of \$7,500. A fifth of the ticket may be bought for fifty cents and, if of the winning number, draws \$1,500. There are smaller prizes for approximations of the right number. Each Sunday at Panama a boy draws a number from a box, and there has never been complaint of unfairness in deciding the winning number. It is difficult to estimate the amount invested each week in the lottery by the Americans, but it runs well into the thousands of dollars. Many of them have won capital prizes. In view of the fact that the moral sense of the nation has condemned lotteries, this free participation in the one at Panama does not constitute a praiseworthy feature of the American occupation.

Each Sunday afternoon or evening in some Canal Zone town the Commission band gives a concert. This pleasing organization has a director who is paid \$2,000 a year and the members receive slightly more than \$3 each for a concert. The band members are canal employees.

The first census of the Canal Zone was taken in

CIVIL ADMINISTRATION

1908, and a population of 50,003 was reported. In February, 1912, another census was taken, and the population had increased to 62,810. However, there were 8,871 employees living in Panama and Colon, which brings the population to 71,682, not including the native populations of the cities of Panama and Colon. The white persons numbered 19,413; the colored, 31,525; yellow, 521; mixed, 10,323; miscellaneous, 1,028. Great Britain had 30,859 subjects; the United States, 11,850, and the remainder was distributed among thirty-eight other nationalities. Of the American citizens, 9,770 were born in the United States, mainly from eight States, as follows: Pennsylvania, 1,375; New York, 1,372; Ohio, 692; Illinois, 453; Massachusetts, 386; Indiana, 382; Kentucky, 369; Virginia, 338. Gatun was the largest town, Empire second, Cristobal third, Gorgona fourth, Paraiso fifth.

Dr. Belisario Porras, as President of the Republic of Panama, will play a decisive part in the next four years in guiding the relations of his country with the United States.

CHAPTER XIX

THE SOCIETY OF THE CHAGRES

“**C**ARAMBA,” exclaims the native Panaman, as the torrential rains soak him through and through, and he wonders what reason Providence has in the prodigal tropical showers. He watches the river Chagres rise under the stimulation of the rainy season from a puny creek, fordable almost anywhere, to a stream as masterful almost as the Mississippi on a rampage.

Balboa saw the same thing, and so did the pirate Morgan, and many Spanish seekers after El Dorado. It was not until the engineering mind began figuring on a canal connecting the Atlantic and Pacific oceans that the tremendous rainfall began to possess utility, and then the river Chagres assumed a significance, and the heavy precipitation a beneficence, which causes orators nowadays to see the hand of God in the forming of the natural conditions of the Isthmus. Thus does man change his conceptions of Deity to suit his needs!

In a lock-type canal, such as the Americans are completing, the river Chagres absolutely is indispensable. Without this river only a sea-level canal could have been built at Panama. For the engineers have harnessed this stream so as to form the great Gatun Lake, comprising all but fifteen miles of the

CHAGRES SOCIETY

Panama Canal. The floods, which for centuries have emptied unrestrained into the Caribbean Sea, will lave the impregnable Gatun dam, or be spilled, at the pleasure of the Americans, through turbine engines to generate power, or flow at their will through the locks to lift or lower the commerce of the world across the Isthmus.

It is not hyperbole, therefore, to say that the Chagres River is the greatest single factor in the success of the Panama Canal. The locks and the Culebra cut are no more than preparations for the utilization of the river.

When the time came for selecting a name for a society which should embrace in its membership the canal workers who had been with the job at least six years, the object of which should be to keep alive the memories of those years in the future, it seemed peculiarly appropriate to name such an organization THE SOCIETY OF THE CHAGRES.

The idea of an organization of this kind first was exploited in December, 1909, when a "Panama Canal Service Medal Association" was organized, with membership limited to employees who had earned the Roosevelt Canal Medal, and having an insurance feature. This movement failed. In August, 1911, William F. Shipley, of the Subsistence Department, initiated a new movement, which reached a head on October 7, 1911, with the organization of the Society of the Chagres and the selection of Col. W. C. Gorgas as the first President. Tom M. Cooke, a canal

THE AMERICANS IN PANAMA

veteran, and head of the division of posts, customs and revenues, is now President.

The Society is thoroughly democratic in its membership, any employee, of either sex, who is white and an American citizen, and who has worked for six years continuously on the canal, being eligible. An applicant must have earned the Roosevelt medal and two Commission service bars, and thereby hangs a tale.

Col. Roosevelt, in a speech to the canal employees at Colon, on November 16, 1906, said: "I shall see if it is not possible to provide for some little memorial, some mark, some badge, which will always distinguish the man who, for a certain space of time, has done his work well on the Isthmus, just as the button of the Grand Army distinguishes the man who did his work well in the Civil War."

The idea here expressed did not reach fruition until October, 1908, when a ton of copper, bronze, and tin taken from old French locomotives and excavators, was shipped to the Philadelphia Mint to be made into medals. Victor D. Brenner was the designer, the medal showing on one side a likeness of President Roosevelt, and on the reverse side a ship in the Culebra cut. They are about the size of a dollar. The first order was for 5,000 medals; and by January 1, 1911, 4,487 had been earned. By the time the canal is finished more than 6,000 will have been earned, every employee who has worked for two years on the canal being entitled to a medal.

For each successive two years the employee works

CHAGRES SOCIETY

he receives a bar, made from the same material and presented by the Commission. Thus, a Roosevelt medal and two bars mean an employee has worked for six years on the canal, and is eligible to membership in the Society of the Chagres.

Col. George W. Goethals' eligibility dates from April 1, 1913, from which date he will have completed the sixth year of his connection with the project. It undoubtedly is true that this medal, which intrinsically is of little value, has held many a man to two years in Panama from a sentimental desire to have something officially attesting his connection with the great task.

There has been much more changing in the personnel of the American force than the public knows, and to have been six years an employee means that one came when conditions literally were rotten and stuck it out until to-day, when they are nearly ideal. The Constitution provides for an annual meeting on the Isthmus until 1915, and then in some American city, or the Canal Zone, as may be elected. On January 12, 1912, the first annual banquet was held at the Tivoli Hotel.

The emblem of the Society is a circular button, nine sixteenths of an inch in diameter, showing on a black background, surrounded by a narrow gold border, six horizontal bars in gold.

A determined effort was made to make Col. Roosevelt the only honorary member, but this has not been accomplished. It would be necessary to amend the Constitution, and as every member, in whatever part

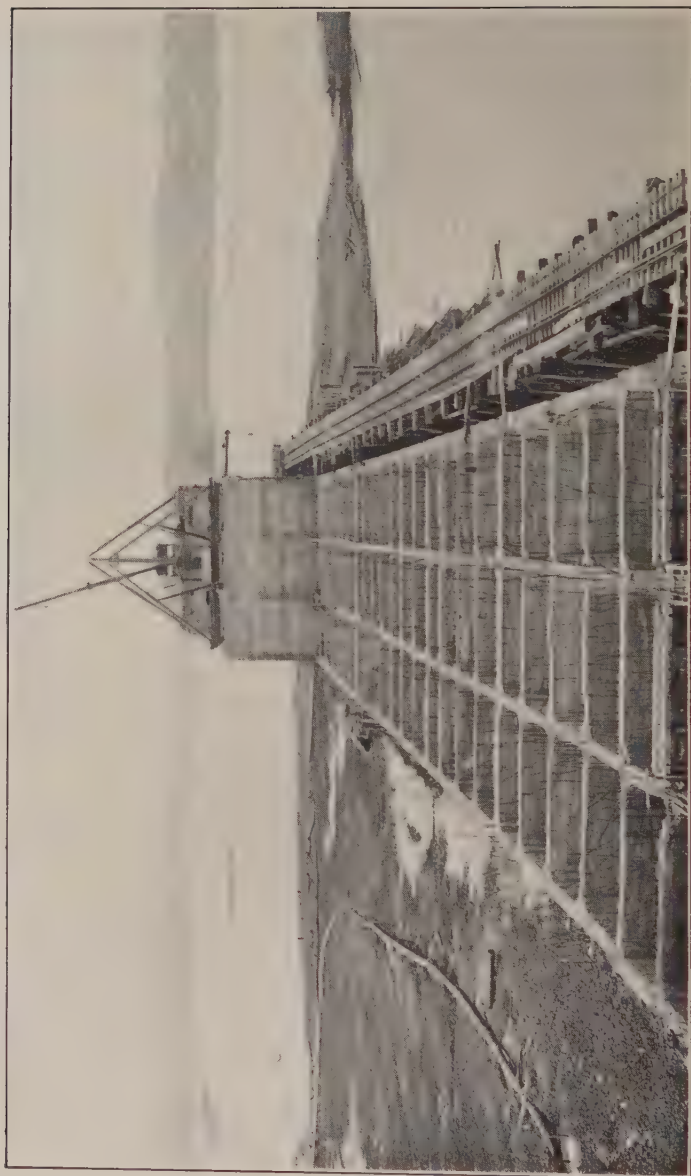
THE AMERICANS IN PANAMA

of the world, has a vote by letter, the two-thirds vote possibly never will be registered.

The first Year Book of the Society was published in January, 1912. It is a volume of 145 pages and contains brief biographies of the members, the Constitution, speeches by Presidents Roosevelt and Taft, in the Canal Zone, and by Chief Engineers Stevens and Goethals. The six-year men all worked under Mr. Stevens and loved him well.

Forty States were represented in the membership of 304 in July, 1912. The following States were not represented: Arkansas, Colorado, Delaware, Nevada, New Mexico, North Dakota, South Dakota, Wyoming. As some of the members have not turned in information as to their native States, the exceptions noted may be represented in the Society. Members who are American citizens, but who were born abroad, represented the following countries: Canada, England, Germany, Russia, Greece, Italy, Ireland, Scotland, Sweden, and South Africa.

Among the biographies the one of Alexander A. Lundisheff perhaps is the most picturesque. He was born in Russia, ran off to sea, joined a circus, became a sailor, crossed the Isthmus in 1888 as an American bluejacket, fought in Mexican revolutions, guarded convicts in Africa, enlisted in our Navy in the Spanish-American War, worked in the Alaska Coast Patrol, helped to fight the Panama revolutionists in 1902 and had his life saved by a beautiful Panaman girl, whom he married, and when the Americans came to Panama went to work under Col. Gor-



Photograph, Underwood & Underwood, N. Y.

PART OF GATUN LAKE—CAPACITY, 1,632,000,000,000 GALLONS.

CHAGRES SOCIETY

gas, in the sanitary department, where he has since remained. He had the unique record of working eight years for the Commission without being sick a day or losing a half hour from work, and had not taken a vacation in that period. Other members, women as well as men, have seen service in all parts of the world.

President Taft, in a speech to the employees in November, 1910, said of the older men: "As the great creation, which was so clear to the professional men who designed it, opens itself in concrete mold to the observation of the layman, the eagerness with which we all look forward to the completion of the work grows apace, and we envy the record of the men to whose skill and courage and energy, persistence and foresight, the canal will forever form an enduring monument!"

The time of the departure of the canal workers is near at hand. The old-timers feel that they have fought a good fight and that henceforth there is laid up for them the admiration which President Taft expressed. In a space of time now measured in months all will have left except those who remain with the permanent operating force. Already they are scattering to the four ends of the earth, whence they came. The Society of the Chagres will become one of the historic organizations of the United States, along with the Grand Army of the Republic, the United Confederate Veterans, the Spanish-American War Veterans, and the Sons and Daughters of the American Revolution.

THE AMERICANS IN PANAMA

THE INCA SOCIETY

This organization includes in its membership only those employees who came to the Canal Zone in 1904 and have been with the job ever since. At the annual banquet at the Tivoli in May, 1912, the eighth anniversary of American occupation, there were found to be only 63 such employees in the Canal Zone.

I. O. P. K.

Recreation ever has been the least satisfactorily solved problem at Panama. In 1904, 1905, and 1906 the employees did not have the Y. M. C. A. club-houses which, after 1907, became the centers of social activities. State Clubs and various social organizations were formed, but most of them passed out of existence, the University Club in Panama being a conspicuous exception.

One night, a few of the boys, who congregated in the box cars connected with the wrecking train, authorized several of their number to arrest an employee suspected of having some cash on his person. He was brought to the cars and placed on trial, on trumped-up charges, before a Kangaroo Court. He was fined the amount of money found in his pockets and the sum was invested in refreshments at the nearest saloon and grocery.

This proved to be so interesting that the events became weekly, no employee knowing when he might be arrested and fined to pay for the refreshments. Out of this incident grew the Independent Order of Pana-

CHAGRES SOCIETY

manian Kangaroos, the only original lodge started successfully among the white canal employees.

The first meeting was on October 10, 1906, and subsequently Kangaroo Courts were organized in Tabernilla, Gorgona, and other Canal Zone towns. A Supreme Court was organized, with a supreme justice, two associate justices, prosecuting attorney, defendant attorney, chaplain, comptroller, clerk, and sheriff. The order was incorporated under the laws of the State of Tennessee, and the Constitution, adopted on March 18, 1908, forbids membership to liquor dealers, gamblers, or procurers, and requires American citizenship, white color, legal age, a belief in a Supreme Being, and an honorable means of support in those accepted. The first Sunday in December is Memorial Day. Clinton O. Simmons was Chief Justice in 1912.

This order has done a great amount of charity work among members, or their families, and others who got in hard lines in the Canal Zone. It is significant of the character of the employees in the sterling ideals maintained. The membership is more than 800.

CHAPTER XX

THE TRADE OUTLOOK

TIME and space, if they will not be annihilated, certainly will be tremendously lessened by the Panama Canal.

On February 11, 1912, a tug and three barges lay at the wharf in Cristobal, on the Atlantic side of the canal. They were needed at Balboa, on the Pacific side, only forty-seven miles across. There were two methods of getting the craft and barges to the desired point, one being to take them to pieces and transport them by the railroad and reërect them on the other side, and the other method being to send them around Cape Horn.

They started on the journey of 10,500 miles on that date, and arrived safely at Balboa on June 16, 1912, consuming 126 days in the trip. If the canal had been finished, the distance of forty-seven miles could have been traversed in ten hours! This is only one graphic illustration of the utility of the Panama Canal.

San Francisco is now 14,000 miles from New York around Cape Horn. Through the Panama Canal it will be 8,000 miles nearer, or a little more than 5,000 miles distant. From New York to Valparaiso, by the Straits of Magellan, the distance is about 9,000 miles. Via the canal it will be less than 5,000 miles.

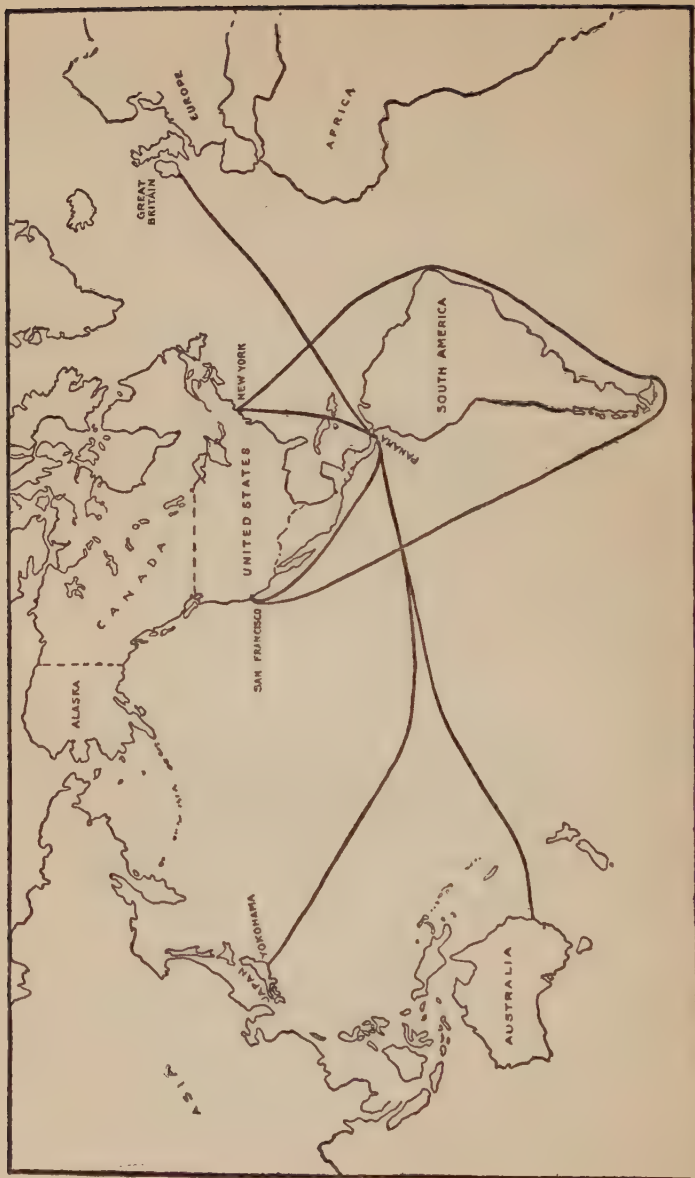
THE TRADE OUTLOOK

Our Atlantic coast will be brought 4,000 miles nearer to Australia than by the Suez Canal, through the Panama Canal route. New York will be 5,000 miles nearer to New Zealand via Panama than around the Cape of Good Hope. The distance to the Philippines will not be materially reduced from Eastern Atlantic ports, but the Panama route will make Hong-kong, Yokohama, and San Francisco ports of call for our own and European vessels, which the Suez Canal does not readily permit.

Equally great advantages in shortened trade routes will come to the Gulf and Pacific ports of the United States. San Francisco, Seattle, and Portland may place their products on our Atlantic coast, the West Indies, the east coast of South America, and in Europe at correspondingly great savings in time and distance.

For coal- or oil-burning ships this saving in time represents an impressive lowering in freight rates. Sailing vessels will not feel the fuel saving, but the difference in time effected by the Panama Canal doubtless will serve to hold that slow-transit method much longer in use than it otherwise would be held for those commodities, like lumber, which do not require speedy delivery.

Already the United States does a larger coastwise trade than any other nation in the world, and the canal will give this a spurt that cannot be measured accurately at present. Pacific coast wheat, wines, lumber, barley, hops, wool, dried fruits, and mining products may be laid down in Gulf and Atlantic ports



THE TRADE OUTLOOK

through the canal much more cheaply than by the continental railroads. Atlantic and Gulf coast machinery, manufactures, textiles, and finished products generally, likewise may be delivered to the Pacific ports at a lower cost.

The great staple products of the South, cotton, tobacco, lumber, iron, and coal, when destined for Asiatic ports, will have an immense advantage by the Panama route, and much of the ocean freight which has been shipped long distances to Eastern ports to ships will go through the Gulf ports. There necessarily will be a radical readjustment of our whole internal freight movements, but the increase in volume still will leave the railroads their proportionate share.

Geographically, the United States is magnificently situated, facing as it does the Atlantic and Pacific oceans and the Gulf of Mexico. The natural flow of commerce will be southward to the republics which so far have bought more in Europe than they have in America. The intensely self-centered industrial development which has characterized the United States to date seems to have reached a turning point, with the nation, after the first great attack at our own resources, ready to look around and participate more extensively in foreign commerce. It is true, of course, that our foreign commerce already is stupendous, but it will be immeasurably greater when our enterprise is directed as absorbingly toward that phase of industrialism as it has been toward internal development.

The Panama Canal is bound to affect the politics of the United States, with especial regard to the tariff

THE AMERICANS IN PANAMA

policy. So long as we were engrossed in our own provincial affairs, taking such foreign trade as voluntarily came our way, the exclusiveness of the high protective tariff was beneficial. When we get out into the realm of international trade with our full capacity, it is inevitable that we must modify that policy as the particular demands of commerce may require.

The United States has been too busy farming, mining, manufacturing, and exchanging these products among its own people to care whether the national flag floated on few or many ships. It must be different when international competition becomes so keen that a nation operating its own ships would have a substantial differential in freight rates over a nation that must depend upon foreign bottoms for its carrying business.

England has had an absurdly disproportionate share of the world's shipping, due partly to our tariff policy, but more largely to the fact that its smaller internal resources made it necessary for its citizens to develop shipping as a main industry. Following the opening of the Panama Canal an increase in American registry will be noticeable.

If we simply are anxious to see ships running about the oceans flying the American flag, Congress has acted effectively by throwing down the bars and allowing American capital not only to build its ships abroad, but to import ship-building materials duty free. It is obvious, however, that such a method of building up our merchant marine will enrich European ship-

THE TRADE OUTLOOK

yards rather than our own, because Congress has set its seal of approval upon the practice of buying abroad if it can be done more cheaply than in the United States. Coastwise ships still must be built in America.

Congress will be called upon to provide some way for handling the passenger traffic that would prefer to go to the San Francisco Exposition through the canal from Atlantic and Gulf ports. This will be coastwise trade, and there are no American ships adequate for the probable traffic. Unless Congress grants a special dispensation allowing the foreign lines to handle this traffic during the Exposition, it is likely that they would have to relay the Atlantic traffic to Bermuda Islands and the Gulf traffic to Cuba, and so make it, by reëmbarkation, travel from a foreign port to San Francisco.

There has been speculation as to whether the canal would pay. Congress has authorized a maximum freight rate of \$1.25 a ton and a rate of \$1.50 for each passenger that passes through the canal. The President has the power, through proclamation, to reduce these rates to any point that will still supply sufficient revenues to pay operating and maintenance expenses. The Suez Canal pays for itself every four years, but it cost less than a third as much as the Panama Canal, which also will require 2,500 employees as a permanent operating force.

Operating and maintenance expenses for the canal in Panama will be, annually, about \$4,000,000. Interest on the investment, part at 2 per cent and part at 3 per cent, will be around \$10,000,000 a year.

THE AMERICANS IN PANAMA

Thus the canal must bring in approximately \$14,000,000 a year to be self-sustaining. Traffic experts estimate that the possible tonnage by 1914 will be 10,000,000 tons. At the \$1.25 rate, the income, therefore, would be \$12,500,000, or \$2,500,000 less than operating cost, but this loss would be reduced by the tolls from passengers. It is possible that the canal may not pay right at the start, but ultimately there is no doubt that it will.

Suez may be expected to fight for its business by reduced rates. This will not be so formidable as our own short-sighted management. Congress, by exempting American coastwise ships from tolls, deliberately affronted England, the largest prospective patron of the canal, because the greatest maritime nation. And England, it should be remembered, controls Suez. Misguided patriotism alone dictated the exemption of our coastwise ships. They already have a natural monopoly of coastwise trade. If the nation desires to give a special industry a gratuity, it should be done without antagonizing the best customer we are likely to have at Panama—England. The American people show an inconsistency in sanctioning this treaty violation, inasmuch as the whole cry for the last ten years has been against special interests and private monopolies fostered by the government. To deliberately subsidize the shipping business, as much a private industry as Standard Oil, not only violates the spirit of the times but inevitably will result in a great economic loss at Panama, if the present method is continued.

THE TRADE OUTLOOK

One advantage Panama will have over Suez will be in the coaling rates. We can sell coal at Panama for \$5 a ton, or a trifle less, whereas \$6 a ton is the prevailing rate at Suez. This saving will go far toward paying for the passage of a ship through the canal. For instance, a ship leaving New York, or Liverpool, would take on only enough coal to run to Panama, where a fresh supply could be obtained, and thus room that otherwise would be filled with coal for the whole journey may be used for additional freight. The same saving to ships will be experienced in securing all kinds of supplies from the government at Panama, while dry docks and other facilities will be available.

Col. Goethals has displayed a high order of business acumen in guiding the government into this policy. The advantage to the United States lies in the fact that other nations will not have to establish coaling stations and repairing facilities on the pretense of caring for their merchant marine, and so lead into a possible infringement of the Monroe doctrine. An incidental benefit of the policy, though decidedly one worth while, lies in the fact that our coal mines will find a great market at Panama through the practice of selling to ships. The government will not have private competition, because private capital could not operate on the margin of profit that will satisfy the government.

The rapid development of South America is the surest promise of a commerce that will make the canal economically profitable. The business that originates

THE AMERICANS IN PANAMA

there and our own expanding foreign trade will be great feeders of the canal, not considering Europe, Asia, Africa, and Australasia.

As the United States becomes more thickly populated the overflow will go largely to the South. With the practical proof afforded at Panama that health can be maintained in a tropical climate, Americans more and more will swarm to South and Central America. Hundreds of canal employees have gone into business in the tropical countries rather than return to the harsher climate and sterner industrial competition of the United States. South America, however, is not the place for the man with small capital such as the United States has been. The cultivation of the staple products, such as bananas, coconuts, coffee, cocoa, sugar, rubber trees, etc., is precarious on a small scale because great monopolies dominate these industries and crush individual enterprise. Syndicate operations on a large scale are the only successful means of business promotion, though here and there the prospector strikes a good thing. For men of ability who are willing to work as employees there are many good openings in Latin America.

The Americans have a great deal to learn from the older nations of Europe in order to make the most of their natural advantage in South American markets. Our merchandise is more attractive to the Latin American because usually it is smarter in design and appearance, though frequently inferior in quality, and simply because the United States dazzles the Southern imagination. The Germans and the English are past

THE TRADE OUTLOOK

masters in getting foreign business. They send out salesmen who speak the native languages, and when they make shipments it is in a manner most convenient to the peculiar conditions of the particular country.

Your American manufacturer or exporter gets the biggest box he can find and puts as much into it as it will hold. Frequently the big box is broken when it is unloaded at the South American port, occasioning trouble to the consignee. Often the shipment is consigned to some interior point to which a mule pack train is the only means of transportation. This occasions more trouble and expense to the purchaser. The Germans do things differently. They pack their merchandise in small packages and in durable boxes, knowing that it may have to be handled over mountain passes by hand or muleback. They have a regard to the high temperature and the character of the merchandise so that it may not spoil. But these are not insuperable faults upon the part of the Americans, and already they are being eliminated intelligently after bitter experience. In nearly all our Eastern or seaport cities every exporting office has a Spanish-speaking attaché to conduct correspondence in the language of its Southern customers.

Among the agencies at work to bring Americans to a realization of the opportunities that lie in plentiful profusion in South and Central America none is more ably and successfully managed than the Bureau of American Republics, in Washington, with John Barrett as Director-General. The most striking fea-

THE AMERICANS IN PANAMA

ture of Mr. Barrett's work is the statesmanlike plane on which he seeks to interest Americans in the twenty republics to the South. Get business is his motto, but get it by straightforward, respectful, and enduring methods. The constant aim of the Bureau is to abolish the foolish opinions Americans have entertained about the business, social, and political capacities of Latin Americans. They are not the comic-opera revolutionist type at which we laugh on Broadway. They are cultured people who expect to be approached as gentlemen, and the periodic fighting that attends a change in administration in some Central American countries does not gainsay that fact.

Mr. Barrett edits a monthly Bulletin which already is in the most wide-awake American exporting offices, and should be in the hands of every business head who directly or indirectly touches South American commerce. Printed as it is in English and Spanish, it is serving to remove many prejudices by making closer acquaintances. An impartial monthly review of all subjects of real interest, industrial, political, and general, enables its readers to keep in touch authoritatively with Latin America. In view of the forebodings some of the Southern republics have had at the possible territorial expansion of the United States at their expense, this Bureau under Mr. Barrett is doing an inestimably valuable service to American business interests by its sympathetic and tactful policy.

The dynamic expansion of American industrial life is the one overshadowing fact in the Western Hemisphere, as indeed it is in the whole world. It is a

THE TRADE OUTLOOK

new kind of conquest, not preceded by the sword, and if we maintain our moral poise will not be followed by any other than happy results to the conquered. English is destined to be the sole language of the Western world. American merchandise will form the bulk of its commerce. American citizens will be found in every out-of-the-way corner of the two continents, carrying with them, even if in diminished luster, the ideals and abilities which have made the nation eclipse all records thus early in its youth. The Panama Canal marks our passage from unfledged provincialism to the full stature of national manhood among the industrial activities of the nations of the world.

CHAPTER XXI

SETTLING OUR ACCOUNT WITH COLOMBIA

THE American people, like the Israelites of old, are a peculiar people, chosen of God to fulfill a high destiny among the nations of the world.

Whether it was a good thing for Puritanism to be set down in the lap of material luxury on the North American continent is not yet disclosed, although we have abundant evidence of the struggle, already sharply drawn, between the spiritual and materialistic forces in the national character.

The Civil War was an even mightier conflict, between the Puritan and Cavalier, than Marston Moor and Naseby. In it the Puritan triumphed even more gloriously. In it the Puritan was clinching the principles of the great English struggle. He was stamping out the embers of the unspiritual forces in Anglo-Saxon character.

Our unparalleled material prosperity is at work to revive the spirit of the Cavalier and to dull the keen edge of Puritanism. Righteousness never has flourished under great material prosperity. The cocksure feeling, that comes from the possession of much worldly goods, is beginning to appear in the external and internal actions of the American nation. The letter of "In God We Trust" remains unimpaired on our currency, but its Puritanic spirit has weakened

OUR ACCOUNT WITH COLOMBIA

perceptibly. We are depending on a big navy to see us through.

Probably no war ever was fought with more disinterested motives than the Spanish-American War. The Americans seemed to relish the opportunity to lay aside the rich pursuits of commercialism for a while to exercise the old spiritual forces of the Puritan. The dash and vitality of that outburst caused Europe to think deeply.

But the Spanish-American War had one result that shows the American people are measurably less determined in their spiritual conceptions than the generation of '65. We kept the Philippines, much as the warriors of Israel kept the plunder of the Philistines when they had been commanded sternly not to make their cause one of material aggrandizement.

Our treatment of the Filipinos has been as unparalleled in its humanitarianism as our conduct in the war that gave them to us. But that is our way of assuaging our conscience for holding them, a sugar-coating process to make the act pass muster. Down in our national heart we know we are holding the Philippines for what they ultimately will mean to us materially, not what we can do for them spiritually. If the ten million Filipinos were in the Southern States, where we could see them and feel the pulsation of democratic forces, and not seven thousand miles away, we would fight another Civil War over them, just as we did over the Negro.

All of this by way of introduction to the act that gave us the Canal Zone. We have the admission of

THE AMERICANS IN PANAMA

the President himself that he abandoned the regular diplomatic methods of securing the territory needed for building a canal in favor of the primitive method of taking it by force. This leads straight to the admission that we set up the Republic of Panama merely to make an otherwise bald steal appear to bear some evidence of justification. It has been shown in a previous chapter that the revolution that gave the Republic its independence was made a success by the United States.

So far, the national conscience has not stirred itself greatly over this act. At least it has not stirred itself decisively, and that is another proof that the Puritan spirit is taking itself much less seriously than it did so short a time ago as 1898. One reason has been that the American people only recently have begun to get the true understanding of what did happen at Panama. President Roosevelt exerted the full capacities of his versatile mind to cloud the situation, so that the moral sense of the people would not be aroused, until it would be too late to undo his act.

He pretended that the treatment Panama had received, as a kind of stepchild of Colombia, warranted the same kind of action we took to free Cuba. His Secretary of State advanced the strained construction of our solemn treaty with Colombia that we were under obligation to maintain the neutrality of the Panama Railroad, and so prevent the soldiers of Colombia from striking down the revolution. The President further recognized the independence of the Republic, and insisted that it was an act as disinter-

OUR ACCOUNT WITH COLOMBIA

ested, for instance, as our recognition of the new Republic of China. In truth, they bear no similarity of feature.

In China the masses of the people were trying to demonstrate an advance in their understanding of government to the point where authority would be recognized as inherent in them, and not an external imposition by an alien line of Emperors. In Panama the masses of the people not only did not know about the revolution until it had passed, but no more than an ordinary mob, such as may be aroused on an hour's notice in any city, participated in it.

It was not necessary that the people of Panama should know about it. The United States had agreed to stand between the clique of Panaman financiers and any offensive act Colombia might undertake. Undoubtedly there had been popular uprisings against Colombia in Panama, but the revolution of November 3, 1903, was not one of them. This revolution had three sources of inspiration—The French Canal Company, the capitalist Junta in Panama, and Theodore Roosevelt's desire to get a canal started before his inherited administration should end.

In this review of the canal President Roosevelt's action in taking Panama has been approved. It is approved as an international act of eminent domain. Where criticism is directed is at our refusal to pay for what we took. The \$10,000,000 we paid Panama was a moral quibble, as may be illustrated.

Any American railroad, or any municipality, county or State, may exercise the right of eminent domain

THE AMERICANS IN PANAMA

to secure property in its right of way, or necessary to their well being. But property so taken must be paid for at a fair valuation to the rightful owner.

The rightful owner of the territory we desired for a canal was Colombia. When we took that territory we took it from Colombia. The way we took it was to participate in a bogus revolution, engineered by a Junta of wealthy Panaman business and professional men. It turned out that the part they played in making the revolution a success was farcical, while the part the United States Marines played was vital.

The Marines at first had orders not to allow either Colombian or revolutionary troops to use the railroad. When this order was issued the revolution had not started. Besides, there were no revolutionists after it did start on the Atlantic side to use the railroad, except a handful of the hirelings of the Junta. The second order the Marines received was that Colombia would not be allowed to settle the revolution by force.

In two days the United States recognized the independence of a republic thus created. Twelve days later it had signed a treaty with this republic guaranteeing that Colombia would not be allowed to recover possession. The treaty recited that the United States was to be ceded a Canal Zone in consideration of this guarantee.

There we have the facts in the "taking" of Panama. What we did was to help the Panama capitalist Junta to steal the Isthmus from Colombia, then, in the division of spoils, we obtained a Canal Zone. The \$10,000,000 to the new republic was part of the ad-

OUR ACCOUNT WITH COLOMBIA

ministration's efforts to create an appearance of regularity in the proceedings. It was meant to ease the national conscience—not the administration's conscience.

Anyone who will spend a month in Panama will discover that the republic would not stand from supper until breakfast if it were not for the supporting arm of the United States. It has become rather a burdensome task, too, as our interference three times with Marines to keep the government from toppling over proves. This is not because the Panamans are inferior to any other Central American peoples. It is because there is not sufficient inherent vitality in so tiny a republic to hold it up alone.

If any American railroad should desire property for a right of way and, instead of condemning it by due process of law, should connive with a neighbor to falsely claim possession of the property and then buy the property from the illegal owner, the action not only would not stand in law but it would outrage public opinion. That precisely is the course we followed at Panama. President Roosevelt did not dare to take the property outright from Colombia, the compensation to be fixed by due process afterward, but connived with a revolutionary Junta, through his Secretary of State, to have the property claimed by a Republic to be set up specifically for that purpose, which Republic would sell the property to the United States.

The whole thing was done with the Rooseveltian dash that won frequently by sheer momentum. Eight

THE AMERICANS IN PANAMA

years later, believing it to be a closed incident, President Roosevelt confesses: "I took Panama and left Congress to debate the matter afterwards." There is a deal of contempt for the acumen of Congress in that remark, and looking back at the way Congress swallowed the incident, it is merited contempt.

It is a closed incident so far as the territory comprised in the Canal Zone is concerned. The issue to-day only is this: Have the American people enough of the old Puritanic righteousness left to insure that if a clear case of national wrongdoing is proved they will make reparation?

Colombia cannot compel reparation, nor can Europe. When we consider Germany and France quarreling over the spoils of Morocco, Italy taking Tripoli, England and Russia partitioning Persia, and Japan annexing Korea, what is left of The Hague to sit in judgment upon the action of the United States in Panama?

Absolutely nothing will compel the United States to do justice—except the still, small voice of national conscience. The action of the Minister from Colombia in declining an invitation to Secretary Knox to visit Colombia, in the spring of 1912, is the limit of Colombia's ability to protest.

But it ought to be set down as a maxim of canal management, if not of national policy, that no neighbor of the canal should be allowed to remain on bad terms with the Americans. It is not good that a nation so near as Colombia should be in a hostile frame of mind toward the United States. This is

OUR ACCOUNT WITH COLOMBIA

true, not so much for what a sense of injustice ranking in the minds of her citizens might precipitate, but because, if anything happened to the canal, Colombia, in the event blame was not promptly fixed, inevitably would have to bear the burden of our suspicion.

There is still doubt as to whether Spain set off the mine that wrecked the *Maine*, but that did not keep Spain from taking the consequences. So with the canal. If it should be disabled without a clear cause or responsibility, the jingoes in the United States would point to Colombia as one with a grudge. Thus, the bad feeling engendered in the taking of Panama might precipitate the mighty United States, in a fit of national passion, upon an innocent nation, more sinned against than sinning.

But, ultimately, the question of reparation must rest squarely upon a moral issue. It is not so much the rights of Colombia that should impel us to an act of reparation as a desire to live up to our own best instincts. The American ideal is something far different from law-compelled righteousness; it rises to the grandeur of righteousness for the sake of righteousness. Colombia suffered materially by our act, but we have suffered morally, and an enlightened judgment would be that we suffer the most.

Is it compatible with the dignity of a great nation like the United States to reverse its position by making reparation? This question more properly should read, Is it compatible with the pride of a great nation like the United States to make reparation? The an-

THE AMERICANS IN PANAMA

swer is: The United States has no dignity to uphold. It may restore its dignity and sense of righteousness only by reversing its wilful and headstrong action. We merely play the ostrich in sticking our national head into the sand of the Panama revolution and fancy our action is hid.

There are three courses open to the United States. The first is to consider the acquisition of the Canal Zone a closed incident and decline discussion or reparation. The second is to pay Colombia a cash indemnity for the loss of her richest province. The third is to make reparation by restoration.

Manifestly, the first course involves national dishonor. This is true even if it has become an international fad for strong nations to pillage the weak ones. The second course would involve the arbitration of Colombia's claim and a payment by the United States in some form for the adjudicated damage. Naturally, in such an event, the excuse for the continued existence of the Republic of Panama would vanish, unless after paying for the whole territory we should make the Republic's title clear by gift.

The third course involves the restoration to Colombia of the territory comprised in the Republic of Panama, except the Canal Zone. It also would involve some cash indemnity equal to the loss of revenues during the nine years of separation, minus the improvements made by the United States. Article XXIV of our treaty with the Republic of Panama seems to have contemplated some such contingency as

OUR ACCOUNT WITH COLOMBIA

this, as we note the fine hand of Secretary Hay in the following:

“If the Republic of Panama shall hereafter enter as a constituent into any Government, or into any union or Confederation of States, so as to merge her sovereignty or independence in such government, union or confederation, the rights of the United States under this convention shall not be in any respect lessened or impaired.”

In other words, if we should restore Panama to Colombia, less the Canal Zone, which ostensibly was all we wanted, the point to be arbitrated would be the value of the Canal Zone. It would be necessary, of course, as the foregoing article provides, that all our privileges under the present treaty with Panama should be binding if the province returned to the sovereignty of Colombia. Those privileges include the vital right to use any rivers or lands in the Republic that may be necessary to the construction, maintenance, operation, or defense of the canal.

Colombia would regain control of a province vastly improved since the separation. The cities of Panama and Colon have been made into modern cities by the Americans. Of the \$10,000,000 we paid to Panama, about \$6,000,000 remains unexpended and invested in New York real estate. This would revert to Colombia, as well as the improvements made with the portion expended. Whatever loss in revenues during the

THE AMERICANS IN PANAMA

separation that Colombia might claim would not be a material consideration to the United States.

Undoubtedly under such an arrangement provision would have to be made whereby the old order of things that existed prior to the revolution should not recur. The United States could not tolerate a turbulent situation on the banks of the canal. It still would have to retain the plenary powers in respect of sanitation and order that exist under the present treaty. This doubtless would be the hitch that would come in attempting such a solution.

The people of Panama, remembering the old days, and keen in the enjoyment of conditions as created and maintained by the United States, probably would object to any solution that gave Colombia renewed sovereignty. It would be far less of an exercise of arbitrary power to overrule this objection than it was to set the republic up in 1903. In whatever solution that may be selected some authoritative actions will be necessary.

Those Americans who balk at the prospect of a large money indemnity to Colombia, for taking Panama, should ask themselves whether any mere love of lucre should stand between us and a clean conscience. The situation in which we are involved may cost dearly to straighten out, but that is the inevitable price, in the individual or national life, of walking in the paths of unrighteousness. The Colombian claim is a call to arms between the forces of good and evil in the American national character. Do we stand at Armageddon, and do we battle for the Lord?

CHAPTER XXII

THE MONROE DOCTRINE

IT is to be doubted if so lion-hearted a policy ever was announced by so weak a people as the principle that is involved in the Monroe doctrine, promulgated in 1823. That it should have stood all the years prior to our attainment of the physical strength to make it good, is proof that its real vitality lies in the truth that it expresses rather than in the battleships we can summon to intimidate its acceptance.

To-day, more than ever, the American people need to study the spirit that prompted that declaration. The United States in recent years has been perilously near to just the violation of it that we prohibited to Europe. It is certain that if we ourselves ever step over its spirit we will need all the steel and powder this resourceful nation can command to hold Europe and Asia back; whereas, if we continue to interpret it aright, the land-hungry nations may look covetously upon the Western Hemisphere, but that same vital quality that restrained them in the days of our weakness will hold them back now.

The Monroe doctrine asserted that the principle of democracy, which had sought a haven in this Hemisphere, must not be pursued and persecuted by the institution of monarchy. The phraseology declared that the Americas must not henceforth be considered

THE AMERICANS IN PANAMA

a place for European colonization, but the spirit of the policy meant that two such irreconcilable systems of government as monarchy and democracy could not live side by side in the same hemisphere, and that the safety of democracy required the exclusion of monarchy.

In these latter days there has sprung up a tendency, not strongly developed as yet, to interpret that doctrine to mean that, while Europe and Asia must keep out, the United States is destined to dominate the whole situation. That instead of America for Americans, it means the Western Hemisphere for the United States.

It is certain that the nations of the Gulf of Mexico and the Caribbean Sea discern such a tendency in the actions of the United States. The United States looms up to them with a strength far more formidable than we are conscious of, and they fear the day when we grow conscious of that strength with a waning sense of Puritan justice.

The Spanish-American War was a revelation to them as it was to us. Far-sighted Latin Americans could read in that altruistic interference in their affairs the forerunner of interferences which might not be so altruistic. So far it substantially is true that we have not interfered anywhere in Central or South America that it was not to the benefit of the nation involved.

When the United States executed the coup that rid Venezuela of Castro it did a service of inestimable value to that nation. When it rid Nicaragua of

THE MONROE DOCTRINE

Zelaya it did a similar service. In aiding Santo Domingo to straighten out its finances, in setting civil government upon its feet in Cuba, and in other instances of interference not so important, the Americans have played the rôle of disinterested friendship.

On the other hand, the manner, in which we acquired the Canal Zone suddenly showed Latin America that, though Uncle Sam might bear the visage of a rector, he could just as readily play the rôle of a strong-arm man not overly scrupulous when he is selfishly impelled.

In the early days of our own republic political controversy revolved around the relation to England, with one faction being intensely provincial, and generally successful, and the other faction rather inclined to take the European view of our affairs. The situation in the republics that fringe the Gulf and Caribbean Sea to-day is identical, only the factions revolve around the issue of American interference.

Our smaller Southern neighbors have grown to look upon American interference as inevitable, with the faction that can enlist our sympathy pretty well assured of success. Hence the revolutionary factions struggle for the strategic position involved in the approval of our State Department. Sooner or later such approval means United States Marines to help the favored side.

This strikingly was illustrated in the June and July Presidential elections in the Republic of Panama in 1912. Dr. Belisario Porras, the popular candidate, openly solicited American military intervention, and

THE AMERICANS IN PANAMA

it was forthcoming. In Nicaragua, in August of 1912, Marines were landed ostensibly to protect American interests, but one faction had allied itself with those interests, so that our interference was in reality to aid that faction of revolutionists.

These incidents are not cited as instances of unwarranted interpretation of the Monroe doctrine. Each was justified by the facts of the individual case. The point in mind is that we are embarked upon a rôle, as umpire in Central and South American affairs, that will require the utmost keenness of Puritanic justice to prevent a change from a policy of altruism to one of open selfishness.

When President Roosevelt announced that if we ever went into Cuba again it would be to stay, he made just such a change imminent. There never was a declaration of policy that more widely missed the true spirit of the Monroe doctrine. It would start the United States upon a course that, in twenty-five years, would reduce every Gulf and Caribbean republic to the position of a satrapy of the United States, with United States soldiers, as in the Philippines, exercising the final powers of the legislative, executive, and judicial functions.

The lesson President Roosevelt had in mind was that the United States could not be continually troubling itself to maintain order among any people that were not capable of self-government. But, with the memory of other great nations, which undertook to manage the affairs of widely distributed peoples by the power of military might, not to mention the fundamental

THE MONROE DOCTRINE

tenets of our governmental faith on such an imperial policy, it will be wise for the Americans to be cautious in endorsing the Cuban declaration.

Our Civil War ought to have taught us that the American people cannot live in the face of a flagrant lie to our institutions. Slavery was such a lie, and it was stamped out. The military control we exercise over the Philippines is another such lie, but so far away and vague that the Puritan conscience does not grasp its significance. The moment we begin the forcible military occupation of Cuba, Mexico, or other American republics, we will be adding other lies to the foundation of our republic, namely, "that all men are free and equal and have certain inalienable rights."

The right of Cuba to manage its own affairs, however wretchedly, is an inalienable right. Our interference is never justified except to enable the Cubans to continue that right. Where we interfere to permanently remove that right, such as would occur in annexation or habitual military supervision, we pass the lie direct upon our own profession of principles.

God made the Americans a superior people to fulfill a high destiny, but he never made them so superior that they can trample all rights of weaker nations in the dust from a supercilious idea that we can manage their affairs better than they.

When President Roosevelt asks, Shall we forgive Cuba unto three times for its shortcomings? the answer of the American people must be, Yea, until seventy-times seven. But this does not mean that the United States must continue to bear the expense of

THE AMERICANS IN PANAMA

such efforts to prevent a collapse in Southern governments. Our interference primarily is to obviate the necessity of European interference, and if we act as police of the Western Hemisphere there should be a compensation, at least, equal to our outlay in such efforts.

Whenever we go into Cuba, Nicaragua, Panama, or any other republic, to protect American and European interests, the cost of the expedition should be assessed against the country which necessitated the expedition. Then we should retire and allow them to try again at the task of self-government. And we should stay off from annexation, or permanent military occupation, as we would from taking a tarantula into our national breast.

There is no truth quite so important for the American people to burn into their consciousness, as with a hot iron, to guide their foreign policy as this: The Lord we serve is no less the God of the Mongolian, the Ethiopian, or the Latin American than he is of the Caucasian and the American. Let us beware what we do against these other peoples in His name.

The wise decision of President Taft to stay out, both of Cuba and Mexico, during recent troubles, was in accordance with the best spirit of the Monroe doctrine. It allows these nations latitude to work out their own destinies, certainly the very least that they could ask. Meanwhile they are responsible for every dollar's damage they do to our own or foreign property, and any attempt to make them pay such damage would be founded in right. Forcible interference,

THE MONROE DOCTRINE

however, automatically cancels a claim for damages, except such as may be won by the sword. And that would mean that our young manhood henceforth would have to be enlisted to sacrifice their lives in maintaining a suzerainty radically antagonistic to true Americanism.

Aside from the turbulent characteristic of the Latin American temperament, the most prolific cause of American interference in Central and South American affairs is the American capitalist. This especially is true in Cuba and Mexico, and in the republics south of Mexico to Panama.

Your American capitalist in these countries smiles indulgently when you talk about the departure of the United States from its principles in establishing sovereignty over the smaller republics. To him there is absolutely nothing on the horizon but the dollar he has invested, and his government does not exist except to guard that dollar. But he goes much further than that. He believes his dollar will have added value if the United States were sovereign instead of the particular native government under which he operates.

The sugar-plantation owners in Cuba are more responsible for the unsettled conditions in that island than the Cubans themselves. And they almost invariably are Americans. They believe that the free trade that would follow American occupation would benefit them as well as other phases of American governmental methods. Hence they finance revolu-

THE AMERICANS IN PANAMA

tions and assiduously work to create public opinion favorable to American sovereignty.

Native political factions, in their extremity, make alliances with the American interests of one kind or another, and so complicate the situation that it appears to be the usual case of a revolution. But the American dollar, even if not the primary cause, always is a potent secondary cause, and for that reason the United States should look a long time before it leaps at annexation or military suzerainty.

So far as the Latin republics are concerned, what difference would it make to them whether a European, or the American power, dispossesses them of self-government? If the Monroe doctrine does not stand as a bulwark against American domination, as well as against European domination, what boots it to them? Would American domination be wiser or less distasteful to a proud people than European domination? To what effect was all the revolting from Spain in the eighteenth and nineteenth centuries if it is to be succeeded in the twentieth century by American sovereignty? And would not the American sword in Cuba be just as relentless in its autocratic sway as the Spanish sword?

We cannot afford to embark on a policy of paternalism in Latin America because of the damage it would do to us through underliving our basic ideals. This generation of Americans has before it the necessity of demonstrating that self-government is possible among our neighbors to the South. If we do not prove this truth, we may build a material civilization

THE MONROE DOCTRINE

as high as the combined achievements of Egypt, Babylon, Greece, and Rome, and still the eternal query will arise, What shall it profit a nation if it gain the whole world and lose its own soul?

The Magdalena Bay incident is typical of the operations of capital in Latin America. Instead of jingoing about Japan over this Bay, why not find out what syndicate of capitalists is trying to force the United States to buy it, by spreading all kinds of rumors against a friendly power? There is no nation directing its foreign policy so wisely to-day as Japan, and it would as soon think of securing a naval base in the Americas as it would of attempting to annex China.

The Senate issued a warning to the world, reaffirming the Monroe doctrine as regards the securing of naval stations in the Western Hemisphere. Europe will respect the Monroe doctrine as long as the United States does. It will respect it as long as the United States maintains it as a disinterested, unselfish pronunciamento. But the moment we begin gobbling up these weak republics, that moment will Europe pounce down upon Central and South America. And then we will need the biggest navy our forests and mines can supply to maintain the Monroe doctrine.

There is more than one South American republic where Germany is regarded in a more friendly light than the United States. Germany has aided Brazil and Argentine to discipline their armies along modern lines, and these republics do not have to grovel at Uncle Sam's feet. Argentine is completing one of the largest battleships in the world. The European policy

THE AMERICANS IN PANAMA

will be to encourage these Latin republics on the assumption that some day they may combine to humble the United States. Napoleon sold the United States the Louisiana purchase and remarked that he thereby sold a territory that would one day humble England.

The most salutary thing that could happen in the American foreign policy would be the apprehension and execution of any American capitalists who inspire revolutions in Latin America, rather than the hounding of these republics, more sinned against than sinning. From now on it is going to be a titanic struggle with the American people to prevent the ascendancy of the dollar over principle in the interpretation of the Monroe doctrine. There is not the slightest doubt about our getting all that rightfully belongs to us. Can we restrain ourselves from taking more than our just desserts?

The Panama Canal makes us rub elbows with Latin America as never before. Secretary Knox, in his 1912 junket to Central America, assured the Latin republics that the United States does not crave one foot of their territory. Such a declaration will serve to keep the Monroe doctrine inviolate better than the largest caliber rifles, because it notified the world that we will not ourselves do what they have been forbidden to do. There is no nation in the world that will dare fight the United States when the right is on our side. We can keep it there only by loving our South American neighbors as we love ourselves.

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